The Chemical Age

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Value of Chemical Exhibitions

THE prospects for the exhibition of British chemical plant, apparatus, and equipment, which will be held in the Central Hall, Westminster, next month, and is being organised by the Association of British Chemical Manufacturers and the Chemical Engineering Group, are reported to be excellent. There is a remarkably representative entry, and every promise of a very large attendance of visitors. An inaugural luncheon is to be held at the Hotel Victoria on July 13, and the opening ceremony will be performed by Sir Harry McGowan.

These hopeful prospects will be further strengthened by the news of the successful 13th Exposition of Chemical Industries held in New York in May. The United States is feeling the depression even more than this country, yet the chemical exhibition there is described as "one of the most successful ever staged." There were 360 exhibitors and over 100,000 visitors. Business transacted during the show period exceeded all expectations and tends to confirm the feeling that within a year there will be greatly renewed activity in American chemical and associated industries.

This, of course, is the spirit in which the present situation should be faced and which supplies just the influence required to restore the confidence that is so much needed. The active interest displayed in the New York exhibits applied to virtually the whole range of chemical products—pulverisers and crushing machinery, colloid mills, laboratory equipment, metals and alloys, pumps, filtration equipment, packages for shipment, portable conveyors, etc. A sample of the metal Rhenium attracted much attention. It was discovered by Dr. and Mrs. Noddack of Berlin in 1925 by means of an X-ray spectograph; it is heavier than gold and has a melting point of 3,440° C. The New York people have achieved success because they refused to recognise the possibility of failure; British chemical organisers have now an opportunity of showing that they can do as well, if not better. The plant exhibition will be a credit to the industry, and its organisers deserve all the support that can be given to them.

Making the Best of it

IN the boom days which some of us can remember, it is believed that the astute financier was able to exploit the same piece of land for the supposed production of rubber, tin and oil in turn. Chemists can scarcely expect to do as well, yet the series of productive happenings in connection with the salt domes of parts of Texas and the Gulf Coast make a fantastic appeal to the imagination. Apparently the deposits of salt left in past ages by the evaporation of some inland sea are more squeezable and flow more easily when under pressure than any of the more common sedimentary rocks. This is supposed to be the explanation of the forty odd domes or cones which exist, rising to within a few hundred feet of the surface, on the coastal plains. Salt has been obtained from these by the usual method of sinking a shaft, sending down water and pumping the brine.

The salt is often capped with a deposit of anhydrite, and this again with a layer of sulphur assumed to have been formed from the anhydrite in past ages by reduction with natural gas and oil. The sulphur is mined in the same manner as the salt, by letting down hot water at 300° F. and pumping up by an air lift the molten sulphur, which is allowed to cool and solidify in towers from which, when the sides are subsequently stripped, a column of golden sulphur remains as a striking landmark when it glistens in the sun. We owe this method to the genius of Frasch; it has placed abundant supplies at the disposal of the world. The general geological upheaval seems to have left spots at the side and near the summit of the cones where pools of oil and natural gas could accumulate, which to-day provide ideal sources for this, with the result that following first salt and then sulphur exploitation, the land above the cone becomes an oilfield.

A new science, that of seismology, has been dragged in to help to find the salt cone based on the experience gained with earthquakes. Sound travels much quicker

through salt than through sandstone, so that when a buried explosive is fired at a centre and the time taken for it to be heard by siesmographs placed at a number of points all round is correlated with their distance from the centre, an indication can be obtained of any buried deposits. Oilfields used to be found by luck from surface indications ; to-day their location is on a highly scientific basis. Perhaps the present glut of oil indicates that industrialists have been too successful in the production of this as of all other commodities. How are we to use more of everything is the most urgent question of the day, but this is a problem for the statesman rather than the chemist.

Third Bituminous Coal Conference

THIS country, we understand from advices from Pittsburgh, will be well represented at the third international conference on bituminous coal to be held at the Carnegie Institute of Technology at Pittsburgh, U.S.A., on November 16 to 21 next. Professor W. A. Bone (Imperial College of Science and Technology, London), Dr. C. H. Lander (director of Fuel Research, London), Dr. R. Lessing (consulting chemist, London), and Dr. W. H. Cadman (Anglo-Persian Oil Co., London), are among those who have accepted the invitation of Dr. Thomas S. Baker, president of the Carnegie Institute of Technology and the organiser of the conferences, to participate in the international meeting. Other English fuel technologists who will either attend the congress in person or contribute papers are Dr. M. Barash (West's Gas Improvement Co., Manchester), Geoffrey M. Gill (consulting engineer, London), J. Ivon Graham (deputy director of the Mining Research Laboratory, Birmingham University), Dr. E. S. Grumell (Imperial Chemical Industries, Ltd., Northwich), Professor H. G. A. Hickling (Department of Geology, University of Durham), Mr. Harald Nielsen (consulting engineer, London) ; Mr. P. C. Pope (secretary of the Institute of Fuel, London), Mr. N. E. Rambush (general manager of the Power-Gas Corporation, Stockton-on-Tees), and Dr. F. S. Sinnatt, assistant director of Fuel Research, London).

France and Germany will also be represented by Professors Mailhe and Camille Matignon, of the Sorbonne, and M. Andre Kling, director of the Municipal Laboratory of Paris, who will contribute papers or attend the meeting. The German representatives will include Dr. Friedrich Bergius, Dr. Franz Fischer, and Dr Ernst Berl. Twelve other German scientists have accepted Dr. Baker's invitation. Austria, Belgium, Holland, Poland, Spain, and Switzerland also will send representatives. In America the best scientific authorities have been secured.

The provisional programme shows that the economic side of the coal industry will be emphasised. The competition between natural gas, water, coal, and petroleum as sources of power will be one of the chief topics of discussion. Carbonisation, gasification, and liquefaction of coal, and new methods of utilisation will also be discussed by recognised authorities. A prominent group of American public men are assisting Dr. Baker in the organisation and administration of the conference, which promises to be fully up to the standard of the previous meetings.

The Birthday Honours List

FROM the King's Birthday Honours List, which was announced on Wednesday, June 3, it is gratifying to learn that the Order of Merit has been conferred on Sir William Henry Bragg in recognition of his eminent services in the advancement of science. At present, Sir William is Fullerian Professor of Chemistry at the Royal Institution and also director of the Davy Research Laboratory. He has at various times held many other distinguished appointments, and has been the recipient of many coveted awards. In November last, he received the Royal Society's Copley Medal for distinguished contributions to crystallography and radio-activity, and earlier in 1930 he was awarded the Franklin Gold Medal, which is one of the highest scientific honours offered by the United States. He has also been the recipient of the Nobel Prize (1915), in conjunction with his son, Professor W. L. Bragg, who is Longworthy Professor of Physics at Manchester University.

Two further awards in this list are of special interest to the chemical industry, being in recognition of gallant conduct on the occasion of the disastrous explosion which occurred at the chemical works of Hickson and Partners, Ltd., at Castleford, in July last. Expressed in these terms, Mr. G. H. Frank, formerly a director and works manager of Hickson and Partners, Ltd., has received the Edward Medal, and Mr. G. D. Horsman, chief officer of the Castleford Fire Brigade (which is a voluntary organisation), has been awarded the King's Police Medal.

Books Received

FARADAY. London : The British Electrical and Allied Manufacturers' Association. Pp. 132. 7s. 6d.

MOTOR BENZOLE : ITS PRODUCTION AND USE. By W. H. Hoffert and G. Claxton. London : The National Benzole Association. Pp. 690. 25s.

THE COLLECTED PAPERS OF CARL WILHELM SCHEELE. Translated from the Swedish and German Originals by Leonard Dobbin. London : G. Bell and Sons, Ltd. Pp. 368. 10s.

CONNECTING LAWS IN ANIMAL MORPHOLOGY. By Hans Przibram. London : University of London Press, Ltd. Pp. 62. 4s. 6d.

THE CHEMICAL ACTIVITIES OF MICRO-ORGANISMS. By Dr. A. J. Kloyver. London : University of London Press, Ltd. Pp. 109. 4s. 6d.

ELEKTROPHORESE, ELEKTRO-OSMOSE, ELEKTRODIALYSE IN FLUSSIGKEITEN. By P. H. Prausnitz and J. Reitstotter. Dresden and Leipzig : Theodor Steinkopff. Pp. 307. Rm. 20.

The Calendar

June 10	Faraday Society : Annual General Meeting : "A Laboratory Study of the Atmospheric Corrosion of Metals." "An Air Thermostat for Quantitative Laboratory Work." Dr. W. H. J. Vernon. "The Quantitative Humidification of Air in Laboratory Experiments." Dr. W. H. J. Vernon and L. Whitby. 8.15 p.m.	Burlington House, London.
10	Electroplaters' and Depositors' Technical Society : "Continental and American Practice in Nickel Deposition." W. T. Griffiths. 8.15 p.m.	Northampton Polytechnic Institute, London.
11	Optical Society. "Young's Theory of Colour Vision." Sir John H. Parsons. 8 p.m.	Imperial College of Science, London.
17	Faraday Society : "Michael Faraday." Dr. Robert L. Mond.	Albemarle Street, London.
17	Society of Glass Technology. 2 p.m.	Sheffield.

Researches on Methanol-Type Catalysts

By Professor Hugh S. Taylor

This article summarises the chief points of an address which was delivered to the Toronto Chemical Association on the occasion of one of their recent meetings. The author is a professor of chemistry at Princeton University, U.S.A.

THE outstanding development in industrial catalysis during the last decade is the application of oxides and mixtures of oxides as agents for processes of hydrogenation. Prior to this last decade, the choice of hydrogenating surfaces was limited to a small list of metallic preparations of which the platinum metals, nickel, cobalt, iron and copper were the most important. The industrial development of oxides for such purposes extended a systematic study by Sabatier of the function of various oxides in the alternative processes of dehydration and dehydrogenation of alcohols. Thus, whereas such oxides as alumina, silica, thoria and the blue oxide of tungsten were pronouncedly dehydrating in their action, such oxides as zinc oxide, manganous and magnesium oxides were pronouncedly dehydrogenating in their effect on alcohols.

The industrial application of these dehydrogenating oxides originated in the use of zinc and manganese oxides as agents for the synthesis of methanol from mixtures of carbon monoxide and hydrogen. As is well known, these oxides, generally in admixture with promoting agents, as for example chromium oxide, have found extended use in the high-pressure synthesis of methanol, an extension of the ammonia synthesis and a fundamental significance, for instance, to the wood distillation industry. Admixtures of such oxides with various alkaline constituents also have been utilised to produce from the same raw materials, carbon monoxide and hydrogen, a series of higher alcohols, applicable as solvents in the paint and lacquer field. That various other potential industrial developments may be anticipated from the further utilisation of hydrogenating oxides and mixtures is evident from recent work by Adkins and his co-workers (*Ind. Eng. Chem.*, 1930, **22**, 1046; *J. Amer. Chem. Soc.*, 1931, **53**, 1091, 1095). Such oxide mixtures were found to induce the condensation of acetaldehyde at 360°. Furthermore, a mixture of copper and chromium oxides has been found by them to be in many ways very much superior to any catalyst known to Adkins for the hydrogenation of several types of compounds, notable among which were the esters, ketones, aldehydes, nitro-compounds, cyclic nitrogen compounds, such as pyridine and quinoline, unsaturated double-bonded carbon compounds, such as cinnamic acid and cyclo-hexene.

Immunity to De-activation by Heat

Yields in the neighbourhood of 100 per cent. were reported quite generally by Adkins in these studies. Adkins claims that such a catalyst is not nearly so senstive as nickel to sulphur or halogen containing impurities in the compounds to be hydrogenated. Indeed, compounds of such poor quality that hydrogenation over nickel was impossible were successfully hydrogenated over the mixture of copper and chromium oxides. It is also claimed that such oxide preparations are less sensitive towards de-activation by heat and that precautions, such as are indispensable with nickel catalyst preparations are quite unnecessary. Air and moisture do not impair the quality of the preparations, less labour and expense are involved in their preparations and a sample may be repeatedly employed. There are certain systems which are responsive to nickel which are not responsive to copper-chromium oxide. In general also the hydrogenations on the mixed oxides occur in a higher temperature range where equilibrium conditions are often unfavourable to work at ordinary or low pressures, so that the extension of this field industrially will call also for an extension of the higher pressure industry.

Industry and pure science are mutually beneficent. The discovery of hydrogenating oxides and mixtures has definitely led to a fundamental development of our knowledge of the mechanism of activation at surfaces and to a revolutionary modification of our ideas concerning the nature of the adsorption process of gases at surfaces. A series of researches conducted by a Canadian chemist, Mr. A. T. Williamson (*J. Amer. Chem. Soc.*, 1931, **53**, 578, 813), at Princeton University, have demonstrated conclusively that on a given surface at least two modes of adsorption of hydrogen may occur. Thus, for example, on a surface composed of manganous and chromium oxides, hydrogen is adsorbed at temperatures below 0° C. in the molecular form, and such adsorbed hydrogen has no reaction efficiency. Above 0° C. a slow second type of adsorption occurs which yields an adsorbed hydrogen capable of entering into hydrogenation reactions.

Velocity of Hydrogen Adsorption

We can conveniently refer to such hydrogen as activated or perhaps, indeed, as atomic hydrogen. The experimental data show that the two types of adsorption are separate and distinct from one another. The low temperature adsorption involves only a low heat of adsorption of the order of 2,000 calories per mol. The adsorbed gas is readily recovered by evacuating the sample in the same temperature range. The high temperature adsorption is much more pronounced. It is fifteen-fold greater at 305° C. than the low temperature adsorption at 7° C. under the same pressure conditions. It is accompanied by a much greater evolution of heat of adsorption, exceeding 19,000 calories per mol. of hydrogen adsorbed. The hydrogen is recoverable by evacuation at 460° C. The adsorption is not an instantaneous process as adsorption is normally assumed to be, but takes place at increasingly rapid velocities with increase of temperature. The velocity of adsorption increases exponentially with the temperature, and one can calculate from the velocity data that an activation energy of 3,000 calories is required on the most active areas of a manganous-chromium oxide surface. The velocity of this activating adsorption varies on surfaces of different activity. Thus, at a given temperature, it was found that the velocity of adsorption of hydrogen on the $MnO\text{-}Cr_2O_3$ surface was 1,000-fold that on a simple manganous oxide surface of inferior activity in hydrogenating reactions. These experimental results necessitate a revaluation of current ideas on adsorption generally and provide definite proof of the nature of adsorption leading to chemical reaction on surfaces.

Ortho- and Para-Hydrogen

The service which industry rendered to science in demonstrating the hydrogenating efficiency of oxide catalysts may now be reciprocated by fundamental science in the presentation of a new tool for the examination of hydrogenating catalysts. The important theoretical prediction of two forms of hydrogen, ortho- and para-hydrogen so brilliantly verified experimentally by Bonhoeffer and Harteck two years ago is the origin of the new proposal. Recent work by A. Sherman and the writer in the Princeton laboratory indicates that the ortho-para-hydrogen conversion is a convenient tool for the evaluation of industrial catalysts. Sherman has shown that, with a very active nickel, para-hydrogen may be produced at liquid air temperatures, whereas previously only charcoal was known to act in this capacity. The conversion has been associated with the presence at the active nickel surface of activated adsorbed hydrogen. With poorer nickel preparations no conversion is secured. This capacity to effect the ortho-para-hydrogen conversion has also been used to confirm the data already presented on the oxide catalysts.

Below 0° C., where only molecular adsorption of hydrogen occurs on these oxides owing to the slowness of activated adsorption in that temperature range, no para-hydrogen conversion is obtained even on the most active oxide surfaces. Above 0° C., however, the oxides in question function well to reconvert para-hydrogen to the ortho-para mixture. The velocity with which the reconversion occurs parallels the known activity of such surfaces for hydrogenation activity. These researches serve well to illustrate not only the extension of our knowledge concerning the nature and mechanism of reactions at surfaces, but also indicate excellently the mutual benefits to be derived from the close association of fundamental science and industry, an association even more necessary in times of depression than in the days of prosperity.

A Bookman's Column

Annual Reports on the Progress of Chemistry for 1930, issued by the Chemical Society at 10s. 6d. net, is an unpretentious volume of 389 pages, but one of vital interest to all serious students of chemistry who desire to keep pace with the constant advance of knowledge. The 1930 volume is the 27th of this invaluable series, for which a representative publication committee is responsible, with Dr. N. V. Sedgwick as chairman, Dr. Clarence Smith editor, Dr. A. D. Mitchell assistant editor, and Miss Margaret Le Pla indexer. It contains a series of articles intended to cover as wide a range as is possible in a limited space, and it is hardly necessary to say that the writers are recognised as admitted authorities on the branches of chemistry with which they deal. The following is the complete list of subjects and authors :—

General and Physical Chemistry, C. N. Hinshelwood, M.A., F.R.S. ; Inorganic Chemistry, H. Bassett, D.Sc., Ph.D. ; Organic Chemistry—(*a*) Aliphatic, E. H. Farmer, D.Sc., (*b*) Homocyclic, G. M. Bennett, M.A., Ph.D., and A. W. Chapman, D.Sc., (*c*) Heterocyclic, S. G. P. Plant, M.A., D.Phil. ; Analytical Chemistry, B. A. Ellis, M.A., and J. J. Fox, D.Sc. ; Biochemistry, A. C. Chibnall, M.A., Ph.D., and J. Pryde, M.Sc. ; Geochemistry, A. F. Hallimond ; Radioactivity and Sub-atomic Phenomena (1929-30), A. S. Russell, M.A., D.Sc. ; Conductivity (special report), Sir Harold B. Hartley, M.A., F.R.S., O. Gatty, W. A. Macfarlane, B.A., and D. M. Murray-Rust, M.A.

As Mr. Hinshelwood explains in the first article on " General and Physical Chemistry," the report is confined, by necessity and by the sanction of custom, to the discussion of a few matters, and can only hope to reflect some of the dominant motives. One of these has been the interpolation of old-established chemical ideas in terms of the physics of the quantum theory. The other writers in turn select the more important developments during the year, and these are dealt with in the strictly scientific spirit. These reports are, of course, meant for the service of men of science in the proper sense, and there is no attempt at any popular presentation of the case. The papers are of the high and responsible quality one expects in a publication sponsored by the Chemical Society, and represent work of permanent value to chemical science.

* * *

THE *Index for* 1930 *to British Chemical Abstracts*, issued by the Bureau of Chemical Abstracts, runs into 705 quarto pages, divided almost equally between authors' names and names of subjects. It is a magnificent example of hard and severely scientific work, carried through with rare throughness and accuracy. The entries, though brief, are adequate for reference purposes, and the bulkiness of the index itself indicates the vast field of work covered by the abstracts themselves. The committee of the Bureau, with its chairman (Professor J. C. Philip), editor (Mr. T. F. Burton), and indexer (Miss M. Le Pla), are once more to be congratulated on the sustained excellence with which this onerous and exacting task is performed.

* * *

ON June 19 a volume of exceptional interest to British chemical industry will be issued by Ernest Benn, Ltd., on behalf of the Society of Chemical Industry and in connection with the jubilee celebrations of that society which take place the following month. It is entitled *A History of the British Chemical Industry*, and the author is Dr. Stephen Miall, well known as a writer who can tell a serious scientific story in a readable way. The eight chapters deal with the heavy chemical industry, dyestuffs, fermentation industries, drugs and fine chemicals, cellulose, metallurgy, gas, coke, and tar, and the paint and varnish industry. Those who have seen the proofs speak highly of the style and matter, and the book promises to be a thoroughly worthy commemorative volume.

* * *

THE most recent developments in processes for producing, recovering and refining motor benzole at coke ovens and gas-works are described in *Motor Benzole : Its Production and Use*, which has been published by the National Benzole Association, Ltd., whose offices are at Wellington House, Buckingham Gate, London, S.W.1. This book, which comprises over 680 pages (price 25s. net), deals with its subject matter in great detail, and is well illustrated throughout. The joint authors, W. H. Hoffert and G. Claxton, are both research chemists to the Association, which has, during the past ten years, done a very considerable amount of research work intimately connected with the benzole industry. As Sir David Milne-Watson points out in his foreword, the contents of the book may, therefore, be accepted as authoritative and reliable. Included in the contents are some 126 tables of data and numerous charts. Throughout the various chapters practical details have been given prominence, but at the same time the underlying theoretical principles of the processes concerned have not been overlooked. The advantages of benzole as a motor fuel have also been fully discussed, with numerous references to the technical literature. To show the fullness with which matters are discussed it is only necessary to quote the headings taken from any one chapter selected at random. For instance, the chapter dealing with absorption processes for benzole recovery covers theories of absorption, influence of water vapour, influence of temperature, comparison of wash oils, removal of benzole from the absorbent, stability of the absorbent, manufacture of absorbents, the active carbon process, and the silica gel process.

* * *

ALTHOUGH several books on principles and applications of electrochemistry have been written in the English language, a corresponding laboratory manual has hitherto been lacking. The English translation of the last and fourth edition of Erich Müller's *Elektrochemisches Praktikum*, which now appears as *A Laboratory Manual of Electrochemistry* (Routledge and Sons, Ltd., pp. 363, 15s. net), is therefore welcomed. This book furnishes an insight into the operation and control of processes which are of industrial importance, in addition to forming the basis of a training for pure research in electrochemistry. The translator, H. J. T. Ellingham, has followed the original text in all essential particulars, and no attempt has been made to re-write the book in terms of the modern theory of electrolytic dissociation since it is considered that the development of this theory on the quantitative side has not yet reached a stage which would warrant its use in a practical manual.

* * *

THE problems of the boiler house engineer are dealt with very thoroughly in *The Chemical Technology of Steam-Raising Plant*, by Henry Norman Bassett (Edward Arnold and Co., pp. 240, 12s. 6d. net). The earlier parts of this book deals with water supplies, filtration and softening. The theory of corrosion has been discussed at some length for a better understanding of it, and methods of dealing with corrosion have been covered fully in respect of boilers, economisers and condensers. The remaining chapters are concerned with fuels and their calorific values (including the sampling of coal), the combination of fuels, the significance of the composition of the flue gases, indicators at recording instruments, boiler testing, furnace linings, boiler laggings and firebars.

* * *

THE recently published volume by Rolls Appleyard, entitled *A Tribute to Michael Faraday* (Constable and Co, Ltd., pp. 204, price 7s. 6d. net) is aptly named, for the discoveries which Faraday made were given to the world freely. It is, indeed, just a hundred years ago that Faraday succeeded in " obtaining electricity from ordinary magnetism," which led to developments whereby electricity for lighting, heating, mechanical purposes, telegraphy, telephony, chemical processes and medical requirements, could readily be generated, with consequent gain to all humanity. We should therefore learn something of this man and his passion for truth quite apart from our existing knowledge of the discoveries which he made, and it is pleasing to find that Mr. Appleyard has collected some interesting facts for us to peruse.

* * *

STUDENTS who are studying for university scholarships and pass out general honours degree examinations in chemistry should find *Chemical Problems and Calculations* by R. H. Gibbs (Edward Arnold and Co., pp. 159, price 4s. net.) of considerable assistance to them. This collection of problems covers a very wide range. So far as chemical analysis is concerned it includes acidimetry and alkalimetry, oxidation and reduction methods, gas analysis and thermochemistry. The section on physical chemistry goes into the subject of the gas laws, vapour pressures of solutions and liquids, molecular weights, law of mass action, velocity of reaction, electrolysis and electromotive force. A selection of miscellaneous problems from university examinations is added to enhance the value of the volume.

Safety Precautions on High Pressure Plant

Preparation of Vessels for Cleaning and Repair

The following notes are abstracted from a paper by Mr. R. J. Woods, of Synthetic Ammonia and Nitrates, Ltd., Billingham, which was presented at the recent Chemical Session of the National Safety First Congress, held at Leeds, May 12.

At the factories of Synthetic Ammonia and Nitrates, Ltd., and other concerns comprising the Billingham group of Imperial Chemical Industries, the safety organisation consists of every member of the firm, from the managing director down to the most junior message boy. Accident prevention and safety is not the sole concern of a separate department, nor is it considered to be a mere adjunct to the usual duties of executives.

Each plant or distinct service has its safety committee composed of managerial and workers' representatives, under the chairmanship of the plant manager. This committee meets at least once every three months to consider progress, and to discuss safety as it affects their particular sphere of activity. At monthly meetings of the works councils, of which there are four, and at the quarterly meetings of the group council, the works safety officer presents a report on the accident position. This is discussed, and members are invited to raise any matters pertaining to accidents or accident prevention. Individual workers are also invited and encouraged to discuss any matter bearing on safety with the safety officer or safety foreman. Added to this routine, propaganda is essentially local in character, photographs being exhibited on notice boards, showing reconstructed accidents or typical hazards, whilst explanatory lists of accidents are published as occasions arise.

Safety Code for High Pressure Vessels

At Billingham the various processes in use present a variety of problems when precautions have to be taken prior to the repair and cleaning of vessels. Some of the processes necessitate the circulation of inflammable gases at very high pressure—250 atmospheres, equivalent to just under 4,000 lb. per sq. in. When a vessel in such a system has to be cleaned out or repaired, all valves in the pipe-line connected to the vessel are closed, and the vessel is blown off to atmospheric pressure in two stages. When the pressure is down to about 50 atmospheres, the blow-off valve is shut for a few minutes, to make sure that the closed valves in the gas mains are not leaking; the blow-off is then completed until the gas in the vessel is at atmospheric pressure, and the vessel is completely isolated by removing sections of the pipe-lines connected to it.

The next operation is to clear away the dangerous gas from the vessel, and also as much of the sludge as possible. This is effected by sweeping out with an inert gas (nitrogen), washing out with water, and finally thoroughly ventilating by passing a current of air. If, after tests and inspection, the vessel is then found to be safe for entry, the clearance certificate is issued, and work may be commenced.

Precautions Against Leakage of Gas

When disconnected, the gas mains will, of course, still contain the inflammable gas at high pressure, and precautions must be taken to guard against leakage of gas past the valve, or, worse still, the opening of the valve. In either case, the result would be an emission of high pressure gas, which would immediately fire, owing to friction at the point of emission. When sections of the pipe have been removed, the open end of the remaining portion leading to the valve is therefore blanked off and the valve is opened slightly until it is filled with gas at the same pressure as the remainder of the system; the valve is then closed again. In this way a double safeguard is obtained—leaking of the valve is eliminated, and accidental opening of the valve will not result in a discharge of gas; whilst if, for any reason, the blank flange blew out, the closed valve will stop any general sustained discharge of gas.

All the high pressure valves are operated by oil pressure, being by this means kept in the closed position. Release of the oil pressure, or a failure to maintain the oil pressure, results in the valve opening automatically. An additional safeguard against accidental opening of the valve is afforded by a hand-locking device, which is operated to hold the valve in the closed position. Every care must therefore be taken by those working in the vicinity of the oil-pressure system pipes, to avoid breaking a pipe by an accidental blow, as this would result in the opening of all closed valves operated by the broken pipe, and would probably lead to very serious consequences somewhere on the plant. When working on low pressure mains containing inflammable gas, fitting slip-plates, breaking in for additional connections, and in changing valves, great care must also be exercised to avoid letting air into the system and thus forming an explosive mixture. This is guarded against by maintaining the gas pressure slightly above atmospheric pressure, and the men wear gas helmets when working under these conditions.

Drying-Out Large Tanks

Drying-out the interior of large tanks should not be effected by the use of coke braziers, particularly if men are working inside the tank at the same time, owing chiefly to the risk of carbon monoxide gassing. Some time ago it was necessary to carry out some welding work inside one of the large ammonia stock tanks. After the preliminary running-off isolation and cleaning out, the tank was certified safe for entry, but the men later reported that they were feeling the effects of ammonia gas, and it was found that they were suffering from the effects of carbon monoxide, arising from a coke brazier which they had installed in the tank. When heating is necessary, electric heaters should be employed.

Professor Kenwood on the Poisons Bill

Dr. H. T. Kenwood, Emeritus Professor of Public Health, London University, past-president of the Society of Medical Officers of Health, and widely known as a public health expert, has issued a statement giving his support to the Pharmacy and Poisons Bill which is about to be discussed on the second reading in the House of Commons:—

"From the public health point of view this is an important Bill," Professor Kenwood says. "There is a great deal of loose thinking upon the Bill, for in the public mind there is a disposition to think of it as relating only to such substances as arsenic, phosphorus, strychnine, etc., and to lose sight of the fact that it includes a great number of substances, containing some poisonous element, which are of great service in administering to the industrial and social needs of the community, and for which there is a great market. These latter are included in Part II of the Bill. It is important that they should be made as available to the public as possible and it is indeed in the public interest that this should be so."

Chemical Patents in 1930

The report of the Comptroller-General of Patents, Designs, and Trade Marks for 1930 states that throughout last year the greatest activity in invention has again been manifest in connection with the chemical industries. Marked progress is being made in the production and application of cellulose, particularly cellulose esters. Paints, varnishes, adhesives and other coatings are being made from cellulose esters and artificial resins, and particular groups of these resins are being developed for electrical insulation and for use as dielectrics. Among dyes, particular attention is being devoted to the anthraquinone vat dyes. The production of alcohol from wood cellulose by hydrolysis and fermention, the preparation of artificial rubber and the destructive hydrogenation of carbonaceous substances are still being actively developed. The production of motor fuels containing "anti-knocking" or "doping" ingredients is also responsible for many applications.

Trade in Central America

A memorandum containing hints for commercial visitors to the Republics of Cuba, Dominica and Hayti, has just been issued by the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1 (Ref. C. 3549). Similar memorandums have also been issued in respect of Salvador (Ref. C. 3551) and Ecuador (Ref. C. 3547).

Eliminating Pump Troubles

A Pump Using Compressed Air as "Piston"

In the "Tungstone" patent air-pressure pump, which is supplied by the Tungstone High Pressure Machine Die Casting Co., of Market Harborough, compressed air is used as a kind of elastic piston to impart the necessary pumping force. Operating on this basic principle, however, air does not become mixed with the liquid as in the case of air lift systems or pumps in which the mingling of compressed air with the liquid effects the raising of the latter to the required level.

Compared with the centrifugal pumps and plunger pumps, the Tungstone pump also embodies other unique features which have the ultimate object of eliminating periodical inspections and the inevitable stoppage which is so often due to lack of inspection and proper maintenance. For instance, there are no working parts in contact with the liquid which is being pumped, there are no parts which require lubrication, and the delivery pipe cannot be choked. Added to this, pumping may be continuous or intermittent, without

The "Tungstone" Patent Air Pressure Pump

the least tendency for spluttering or for the diffusion of the liquid. The absence of spluttering is very desirable where pumps are to handle liquids which have a tendency to "froth" or liquids which are greasy.

As may be seen from the accompanying illustration, the body of the "Tungstone" pump essentially comprises two cylinder-like reservoirs, one of which empties under pressure, whilst the other is filling by gravity. At the low air pressure of 15 to 20 lb. per square inch, liquid may be forced to any reasonable height at variable and controllable delivery speeds, as the pump is so designed that it automatically takes its low air pressure supply from a main of any higher pressure. The materials of construction employed are of a sufficiently wide range to meet requirements necessary in handling acids, alkalies, aqueous solutions of chemical salts, oils, and greasy liquids. Pumps at present in use are made in antimonial lead, chemical lead, cast iron, glass, acid-proof earthenware, ebonite, staybrite steel, and a special non-ferrous alloy.

Among present users are the Bleachers' Association, Ltd. (Bolton), Wm. Blythe and Co., Ltd. (Church), Transparent Paper, Ltd. (Bury), British Vegetable Parchment Mills, Ltd. (Northfleet), Sadler and Co., Ltd. (Middlesbrough), Courtaulds, Ltd. (Coventry), Unilever, Ltd. (Bromborough), Kemball, Bishop and Co., Ltd. (London), and many other well-known firms in the chemical and chemical-using industries. In some of these cases single pumps are handling 30,000 gallons of sulphuric acid (sp. gr. 1·36) per hour, delivery being effected to a height of 45 feet.

A working model of the "Tungstone" patent air-pressure pump will be on view at the forthcoming British Chemical Plant Exhibition, Central Hall, Westminster, July 13–18.

Dorr Co. and Oliver United Filters

An Important American Fusion

Mr. John Van Nostrand Dorr and Mr. Edwin Letts Oliver announce a union of the businesses and assets of the Dorr Co. and Oliver United Filters Inc. This union was brought about on June 1 by the formation of a new company, to be known as the Dorr-Oliver Corporation, under the joint management of Messrs. Dorr and Oliver. The Dorr-Oliver Corporation will function through its two wholly owned operating units, a new Dorr Company Inc. and a new Oliver United Filters Inc. Mr. Dorr and Mr. Oliver will head their respective companies and with the aid of their present executive and technical staffs, will continue on behalf of Dorr-Oliver Corporation the businesses which they have individually initiated, organised, and expanded so successfully in the past.

The businesses of the two uniting companies are of long standing and complementary. The Dorr Co. occupies a leading position in the fields of agitation, classification, and sedimentation through its equipment, built up around the original inventions of its founder, Mr. John V. N. Dorr; and the Oliver United Filters Inc. occupies a similar position in the field of filtration through the inventions of Mr. Edwin L. Oliver and Mr. E. J. Sweetland. The union should, therefore, make it possible to offer to industry a more complete line of equipment and engineering service than either company could hope to offer individually.

The fields covered by the two concerns are related so closely from a technical standpoint that the joint use of technical information and the carrying on of joint research and development is expected to result in more effective development and improvement of the equipment and processes which they have contributed to industry. Both companies have built up technical staffs and manufacturing facilities at strategic locations throughout the world for the carrying on of their businesses which have grown to international proportions. The two companies have frequently co-operated on the same projects, and, in many instances, the equipment of both is used at different stages of operation in the same plant. The founders of both companies have enjoyed a friendship extending over almost a quarter of a century and the long acquaintance of many members of the staffs has prepared them for effective co-operative effort. Under the union of interest effected, there will be preserved to clients the close relations which they now enjoy with the respective staffs of the old organisations.

Drug and Fine Chemical Wages

Majority Vote Against Employers' Terms

The recent ballot of Union members employed by members of the Drug and Fine Chemical Manufacturers' Association shows a very widespread opposition to employers' terms for a new national agreement. The Employers' Federation represents 34 firms, or one-third of the principal firms in the section.

A very serious situation may arise if the union executive is finally instructed by the members not to enter into any agreement with federated employers, as happened from 1922 to 1925. This would mean that in at least 60 firms where Union membership is 60 per cent. or over, isolated stoppages would occur wherever any attempt was made by firms, federated or non-federated, to change wages and conditions by posting notices.

Since 1925 only two stoppages have occurred in federated establishments, whilst 32 stoppages have occurred in the same period in non-federated firms. The reason is that 98 per cent. of the disputes arising in federated firms have been amicably adjusted by means of the Joint Disputes Committee set up under the agreement which does not cover the non-federated firms. The Union is continuing to exhaust all possible avenues to secure some amicable settlement. If the employers are prepared to withdraw their proposals for male workers between the age of 21–24 years and modify the wage cuts, the hostility of the workers, it is thought, might be lessened.

Strike Ballot Result, May 29

For stoppage, June 22, in support of Union's new agreement terms, majority in favour: 4 to 1.

For stoppage, June 22, to maintain existing terms, majority in favour: 3 to 1.

For employers' new terms, majority against: 30 to 1.

For further negotiations, majority in favour: 10 to 1.

Chemical Industry Lawn Tennis Tournament

First Round Results and Second Round Draw

KEEN interest is being shown in the Chemical Industry Lawn Tennis Tournament, which is being organised by THE CHEMICAL AGE. Only one match in the First Round had to be scratched, owing to travelling difficulties; all the others were played off and the scores are recorded below.

The results of the draw for the Second Round are also announced in this issue. Competitors should note that all games in this round must be played off by **June 23,** and the results, signed by the winners and the losers, forwarded to THE CHEMICAL AGE, Bouverie House, 154, Fleet Street, London, not later than Wednesday, June 24. As in the First Round, players must make their own arrangements for playing off their matches on a ground mutually agreed upon. In the event of disagreement the first name drawn shall have the right to choose the ground. An illustration of the Challenge Cup to be presented to the winners of the Tournament by Benn Brothers, Ltd. (the proprietors of THE CHEMICAL AGE), appeared in THE CHEMICAL AGE of May 9.

First Round Results

H. Anning and T. Baxter won 6—0, 6—0, against W. A Godden and L. W. Russell.

W. S. Vorley and G. K. Skidmore won 6—2, 6—1, against P. Meerendonk and H. L. Shephard.

G. Stanford and J. Shirreff won 6—2, 6—3, against G. A. Hoy and E. J. Cole.

J. W. Urban and F. S. Mortimer won 6—3, 7—5, against H. T. Stanley and A. Whittle.

L. Anderson and F. Wildman won 11—9, 6—3, against J. Carnell and W. Taylor.

S. Perridge and W. L. Alldis won 6—4, 6—4, against A. T. Young and V. Cripps.

S. B. Gane and D. E. Raine, walk over against K. W. Thorndyke and R. Hacking.

J. Marquick and F. Brown won 6—3, 7—5, against I. R. Peake and A. G. Hay.

N. J. Price and J. Ferguson-Davie won 6—0, 6—1, against A. C. Hitchon and L. A. White.

W. Tracey and D. G. Blow won 6—4, 6—3 against M. How and J. Ince.

Second Round Draw

H. Anning and
T. Baxter (British Industrial Solvents, Ltd., London. 'Phone: Clerkenwell 2364).
v.
S. J. Adams and
A. E. Carter (The British Drug Houses, Ltd., Graham Street, City Road, London, N.1. 'Phone: Clerkenwell 3000).

W. S. Vorley and
G. K. Skidmore (Imperial Chemical Industries, Ltd., Imperial Chemical House, Millbank, London, S.W.1. 'Phone: Victoria 4444).
v.
S. Newman and
E. J. Lawrence ("The Industrial Chemist," 33, Tothill Street, London, S.W.1. 'Phone: Victoria 8836).

G. Stanford and
J. Shirreff (Johnson Matthey and Co., Ltd., Hatton Garden, London. 'Phone: Holborn 6989).
v.
H. Nowell and
K. L. Fuller (The British Drug Houses, Ltd., Graham Street, City Road, London, N.1. 'Phone: Clerkenwell 3000).

J. W. Urban and
F. S. Mortimer (Graesser-Monsanto Chemical Works, Ltd., Victoria Station House, Victoria Street, London, S.W.1. 'Phone: Victoria 1535).
v.
George T. Gurr and
M. W. Papillon (George T. Gurr, 136, New King's Road, Fulham, S.W.6. 'Phone: Putney 1463).

L. Anderson and
F. Wildman (Boots Pure Drug Co., Ltd., Station Street, Nottingham. 'Phone: Nottingham 43583).
v.
S. B. Gane and
D. E. Raine (Johnson Matthey and Co., Ltd., 71/73, Victoria Street, Birmingham. 'Phone: Birmingham Central 6726/7).

S. Perridge and
W. L. Alldis (Chemicals and Coke Ovens, Vintry House, Queen Street Place, London, E.C.4. 'Phone: Central 1411).
v.
G. C. Backinsell and
R. A. Nottingham (Le Grand, Sutcliff and Gell, Ltd., The Green, Southall, Middlesex. 'Phone: Southall 2211).

J. Marquick and
F. Brown (British Industrial Solvents, Ltd., London. 'Phone: Clerkenwell 2364).
v.
W. Tracey and
D. G. Blow (The British Drug Houses, Ltd., Graham Street, City Road, N.1. 'Phone: Clerkenwell 3000).

N. J. Price (Chance and Hunt) and
J. Ferguson-Davie (I.C.I.), Imperial Chemical Industries, Ltd., Oldbury, Worcs. 'Phone: Broadwell 1521).
v.
W. Speakman and
S. E. Chaloner (Graesser-Monsanto Chemical Works, Ltd., Ruabon. 'Phone: Ruabon 3).

Alleged Infringement of Trade Mark

IN the Chancery Division on Tuesday, before Mr. Justice Luxmoore, counsel moved on behalf of the Continental Laboratories against Albert Alberman to commit him for breach of an injunction restraining him from infringing the plaintiffs' trade mark "Taxol."

Counsel stated that the trade mark was for a chemical substance prepared for use in medicine and pharmacy. In December, 1926, the plaintiffs obtained an order by consent against the defendant restraining him from infringing their trade mark. In February of this year plaintiffs learned that defendant was importing into Northern Ireland boxes of "Taxol" which contained circulars bearing the trade mark of the plaintiffs.

Mr. Shelley, for the defendant, said if his client had committed any breach of the injunction, it had been inadvertent, and he humbly apologised, fully and unreservedly. He had given instructions that no goods supplied to him should bear the trade mark of the plaintiffs registered in this country. He was not aware that the plaintiffs' trade mark appeared on the circular or label on the goods in question. The mark did not appear on the exterior of the package, and he had no reason to suspect any changes in the get-up of the interior. He never intended any disrespect to the court, and in the future he did not intend to import "Taxol" at all.

His lordship said he was prepared to accept the explanation of the defendant. He would make no order for committal, but defendant must pay the costs of the application.

Bouverie House Presentations

MR. E. G. BENN and Miss Catherine Newbald, whose wedding took place on Thursday last at St. Dunstan's-in-the-West, Fleet Street, London, were presented on Monday with a silver coffee service, subscribed for by the staff of Benn Brothers, Ltd., and Ernest Benn, Ltd. The presentation took place in the reception room of the two companies (of which Mr. Benn is a director) at Bouverie House, and was made by Mr. E. H. Hallows (manager of *The Gas World* and chairman of the sta[illegible] Social Circle Committee) and Mr. A. J. Grieve (s[illegible] Committee).

From Week to Week

THE honorary degree of D.Sc., University of Sheffield, is to be conferred on Sir William Henry Bragg at a degree Congregation on July 4.

RECENT WILLS include:—Sir Michael Henry Lakin, of The Cliff, Warwick, formerly head of Greaves, Bull and Lakin, lime and cement manufacturers, gross estate £301,473 (net personalty £288,510); John Walker, chemical manufacturer, Ayr, £20,831.

THE NATIONAL STEEL CORPORATION, of Pittsburg, U.S.A., is offering through a large banking group £8,200,000 first mortgage 5 per cent. sinking fund bonds due April 1, 1956. These funds are to be used to finance recently completed extensions of plant properties and for working capital.

AT the First International Gas Conference held in London this week, Mr. Harold E. Copp, the president, announced the inauguration of the International Gas Union (Union Internationale de l'Industrie du Gaz). Herr Fritz Escler (Switzerland) is to be the first president of this new Union, which will have its headquarters in Paris.

THE VACUUM OIL CO. is to erect a new oil refinery at Port Melbourne, Australia. The proposed expenditure is £1,000,000 When this refinery is completed the company will cease the importation of motor spirit and other products, and whilst utilising imported crude oil they have in mind the possibility of ultimately developing an Australian oil industry.

GEORGE C. LEWIS, president of The Darco Sales Co., and general manager and vice-president of L. Martin Co., has been installed as president of The Chemists' Club, New York, succeeding L. V. Redman, vice-president and director of research and development of the Bakelite Corporation. Daniel D. Jackson, executive officer of the Chemical Engineering Department, Columbia University, was elected vice-president.

THE MINERAL TRANSPORT USERS' ASSOCIATION of 8, Lloyd's Avenue, London, E.C.3, and Red Doles Chambers, Huddersfield, has been registered as a trade union under the Trade Union Acts, with Mr. L. A. Kenworthy as general secretary and Mr. J. L. E. Straker, as treasurer. The chief object of this Association is to promote the interests of owners and users of railway and road vehicles engaged in mineral transport. Its president is Captain Roland Addy, managing director of the Carlton Collieries Association.

THE THIRD INTERNATIONAL CONFERENCE on Bituminous Coal to be held at the Carnegie Institute of Technology in Pittsburg, November 16–21. These conferences are organised for the purpose of finding new uses for soft coal. This year the programme will include papers on the carbonisation, liquefaction, and gasification of coal; by-products; the mechanism of combustion; cleaning of coal and its preparation for the market; pulverised fuel; power plants; and domestic heating. Emphasis will be placed on the economics of the new processes discussed.

THE MANCHESTER CITY COUNCIL is again offering a number of scholarships tenable in the Faculty of Technology of the University of Manchester. Successful candidates are required to follow a full-time course leading to the degree of Bachelor of Technical Science in the College of Technology, and matriculation or its equivalent is an essential qualification. For students who have been engaged in industry, and who have attended part-time day or evening classes, the scholarships are of the value of £100 per annum, while for students leaving Secondary or Central Schools the value is £60. Both classes of scholarships are tenable for three years.

TWO SERIOUS EXPLOSIONS followed an outbreak of fire at the works of the Staffordshire Chemical (1917) Co., Ltd., at Chatterley, Stoke-on-Trent, on Wednesday last, June 3. Three men were seriously injured and were removed to the North Staffordshire Royal Infirmary, where two of them, Reginald Nixon (25), of Temple Street, Tunstall, and Cecil Gourdjian (19), of Shepherd Street, Biddulph, died the same day. The fire originated in the benzol refinery, causing two large storage tanks close by, each with a capacity of about 2,000 gallons, to explode. A large garage and the works laboratory also caught fire, and both buildings were gutted. The remaining injured man, Arthur Rowley (56), of Peel Street, Longbridge, Hayes, is still in a serious condition.

A SURVEY of the work accomplished on the solvent analysis of coal is contained in *Information Circular* 6486, recently issued by the United States Bureau of Mines.

MEMBERS of the Physical Society, through the kindness of Professor J. A. Crowther, M.A., Sc.D., have been invited to visit the Physics Department of the University of Reading on Saturday, June 20.

THE NEW HEADQUARTERS and central laboratory of the British Non-Ferrous Metals Research Association, Regnart Buildings, Euston Street, London, N.W.1, will be officially opened by Lord Rutherford, F.R.S., on Monday next, June 8, on the occasion of the Association's annual meeting.

CUTS in the salaries of employees at the Billingham factory of Synthetic Ammonia and Nitrates, Ltd., which are to take effect on the first days of July and October, vary from 2 to 10 per cent., men with salaries of £250 being expected to sacrifice 6 per cent. The reductions affect every member of the staff, including directors.

LORD TRENT, who was formerly Sir Jesse Boot, founder of Boots Pure Drug Co., of Nottingham, underwent an operation on Sunday last, May 30. It was performed by Dr. Halliwell, assisted by Dr. Beckett-Overy, of London, who went specially from England to Jersey by air. Bulletins which have been issued report satisfactory progress.

THE Secretary of State for Dominion Affairs has appointed Mr. Thomas Lodge as the United Kingdom member of the Board of British Phosphate Commissioners, under Article III of the schedule to the Nauru Island Agreement Act, 1920, in succession to the late Sir George Saltmarsh, who was killed in the express train accident at Leighton Buzzard on March 22. Mr. Thomas Lodge is chairman of the Danube Oil Co.

A COMPREHENSIVE SURVEY of the sugar beet industry, which has been prepared by the Ministry of Agriculture during the past year, will be published during the course of this month. This survey will deal with sources and uses of sugar production, consumption and costs, the history of the industry at home and abroad, cultivation and harvesting, field and factory by-products, field and industrial labour, educational research, farming and factory operations, sugar beet manufacture, transport from field to factory, sugar taxation, State assistance, and marketing and prices.

AT THE REQUEST of a producer of anthracite coal for the domestic market of the United States, investigations have recently been made with the object of developing a process for applying permanent waterproof colour trade mark to coal. In the course of experiments with various methods of colouring anthracite, it was found that the lumps would retain a permanent colour after contact with aqueous suspensions of water-insoluble pigments of various types. On this basis a large scale process has been worked out, and the application of colour as practised at the mines was described by M. W. Weiss and G. J. Esselen at a recent meeting of the American Chemical Society.

PROFESSOR C. H. DESCH, D.Sc., Ph.D., F.R.S., has been appointed superintendent of the metallurgy department of the National Physical Laboratory, in succession to Dr. Rosenhain. Professor Desch, who is a Fellow of the Institute of Chemistry, is at present professor of metallurgy and Dean of the Faculty in the University of Sheffield, and was formerly professor of metallurgy in the Royal Technical College, Glasgow, and Graham Young Lecturer in metallurgical chemistry in the University. He will not take up his new appointment until February, 1932, as he had previously accepted an invitation from Cornell University to give a course of lectures there during the winter session of 1931–32.

Obituary

SAMUEL WILSON PARR, president of the American Chemical Society in 1928, a retired professor of chemistry at the University of Illinois, and founder of the Parr Calorimeter Co., died at his home in Urbana on May 16, at the age of 74, after an illness lasting several weeks. Professor Parr began his career as a teacher at Illinois College. He was known best for his research on the composition, weathering and spontaneous combustion of coals, the invention of platinum substitutes and acid-resisting alloys, and his studies on the low-temperature carbonisation of coals, particularly those of the State of Illinois.

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Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

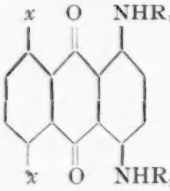
Abstracts of Accepted Specifications

344,116. CHLORIDES AND ANHYDRIDES OF ALIPHATIC ACIDS. Soc. des Brevets Etrangers Lefranc et Cie, 21, Avenue Montaigne, Paris. International Convention date, January 8, 1929.

Dry alkaline salts of aliphatic acids are treated with sulphuryl chloride in the presence of a solid inert diluent, with or without a solvent and at a low temperature. The diluent may be sand, or may be a substance which neutralises the inorganic acids liberated, *e.g.*, a phosphate, silicate, or carbonate of calcium, magnesium or barium. In an example, a mixture of the calcium salt of the aliphatic acid with sand and calcium carbonate is treated with sulphuryl chloride or its constituents, and the chloride or anhydride of the aliphatic acid distilled off at ordinary or reduced pressure.

344,117. DYES. A. G. Bloxam, London. From Soc. of Chemical Industry in Basle, Switzerland. Application date, December 27, 1929.

A compound having the general formula :—

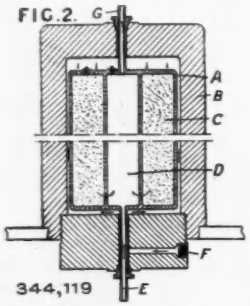


where x in one case stands for a nitro group, and in another case for an NHR_1 group, R_1 stands for hydrogen or alkyl, and R_2 for an aromatic or hydro-aromatic residue, is treated with a reducing agent. The products may be sulphonated, alkylated, or acidylated, and dye cellulose derivatives, animal fibres and colour varnishes blue to blue-green shades. The alkylation may be effected by alkyl esters of the aromatic sulphonic acids, alkyl halides, alkylene halides, alkylene chlorhydrins, and alkylene oxides, and acidylation with acetic anhydride or benzoyl chloride. Examples are given.

344,119. OXYGENATED ORGANIC COMPOUNDS AND HYDROCARBONS. Du Pont Ammonia Corporation, Wilmington, Del., U.S.A. Assignees of R. Williams, of Du Pont Ammonia Corporation. International Convention date, December 31, 1928.

In a cyclic process for producing hydrocarbons or oxygenated organic compounds from hydrogen and an oxide of carbon, the gases are admitted at F and heated by passing upwards around the catalyst chamber A. The gases then pass downwards through the main catalyst C at 550° C., make-up gases are added at E., and the mixture passes through a purifier D to the outlet G. The products are then removed and the gases returned. Both catalysts may be mixtures of copper, chromium and zinc oxides for producing oxygenated organic compounds.

FIG. 2.



344,119

344,147. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, February 27, 1929. Addition to 344,057. (See THE CHEMICAL AGE, Vol. XXIV, p. 501.)

Negatively substituted Bzl. Py 1/—2 : 2′-benzanthrone-pyrazolanthrones are treated with nitrogenous compounds having at least one reactive hydrogen atom attached to the nitrogen atom, other than amino-pyranthrones and their substitution products. Examples are given of these products, which are similar to those described in 344,057.

344,165. DESTRUCTIVE HYDROGENATION. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 31, 1930.

Coal, tar, mineral oil, conversion products, etc., of high molecular weight are subjected to destructive hydrogenation and cracking. The hydrocarbon gases obtained are treated in an electric arc to obtain hydrogen for the destructive hydrogenation.

344,166. ISOQUINOLINE DERIVATIVES. Boots Pure Drug Co., Ltd., R. Child, and F. L. Pyman, Station Street, Nottingham. Application date, Janaury 31, 1930.

1-Halogenalkyl or 1-cyano-alkyl derivatives of 3 : 4-dihydro-isoquinoline in which the 6-position is occupied by a methoxy group or the 6- and 7-positions by methoxy groups or by a methylene dioxy group, are obtained by treating with a dehydrating agent the appropriately substituted acidyl derivatives of β-*m*-methoxy-phenylethylamine, β-3 : 4-dimethoxy-phenylethylamine, or β-piperonyl-ethylamine. The preparation of the phenylethylamine derivatives and their subsequent treatment are described.

344,174. AMINES. Naugatuck Chemical Co., Elm Street, Conn., U.S.A. Assignees of C. Coleman, 87, Prospect Street, Passaic, N.J., U.S.A. International Convention date, February 15, 1929.

Aniline is treated with formaldehyde at 40° C. for two hours, water is separated, aniline hydrochloride or hydrochloric acid added, and the mixture heated to 80° C. for 24 hours. The acid is neutralised, and water and aniline distilled off. The product is 4 : 4′-diamino-diphenylmethane, which is used for preventing ageing of rubber.

344,213. NITROSYL SULPHURIC ACID. A. Kleijn, 74, Palestina-straat, Rotterdam, and Naamlooze Vennootschap Chemische Industrie Van Hasselt, 7, Sophialaan Amersfoort, Holland. Application date, February 27, 1930.

Nitrosyl-sulphuric acid is comminuted with activated charcoal, bleaching or diatomaceous earth, or silica gel, and mixed with dry substances such as calcium salts of phosphoric, carbonic or organic acids, or calcium hydroxide. The mixture is used for bleaching flour, the water present liberating nitrogen trioxide and the calcium compounds combining with the liberated sulphuric acid.

344,250. DYES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 24, 1930.

These dyes are obtained by coupling diazo compounds with amides of 5-pyrazolone 3-carboxylic acids, which may be substituted in the 1-position of the pyrazolone ring and in the amide NH_2 group. Some of the products may be converted into complex metal compounds. A number of these products and their use in dyeing are described.

344,282. PHENOLS. Metallges Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, June 29, 1929. Addition to 305,657.

Waste water from coking plant or from cellulose factories is treated with an absorbent to extract phenols which are subsequently removed by a solvent, which is then expelled by means of steam. The absorption and treatment with solvent and the transition between the two are carried out in the absence of air or other gas.

344,336. DYES. C. Shaw, J. Thomas, and Scottish Dyes, Ltd., Earl's Road, Grangemouth. Application date, August 23, 1929.

Dibenzanthrone or its subsitution products are treated with sulphides of phosphorus at 250° C. or over, and the products dissolved in alkalies for use in dyeing. Alternatively, the products may be dyed from a sodium sulphide or hydrosulphite vat. Several examples are given.

344,339. PHENOL DERIVATIVES. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 24, 1929.

Materials other than foods and pharmaceutical preparations are protected from attack by fungi or bacteria by treating with a mixture of polyhalogenated mono-cyclic phenol or an alkali compound or ester thereof, and benzoic acid or a substituted benzoic acid or an alkyl ester or alkali compound thereof. Several examples are given.

344,367. CRACKING OILS. Shell Oil Co., 200, Bush Street, San Francisco, U.S.A. Assignees of A. M. Wood, of Shell Co., Martinez, Cal., U.S.A. International Convention date, November 26, 1928.

An apparatus is described in which oils are cracked under pressure, the fractions boiling below 300° C. being previously removed.

344,394. HYDROCYANIC ACID. R. Willstätter, 29, Mohlstrasse, Munich, Germany. Application date, December 4, 1929.

Animal and vegetable materials are stored in closed chambers and preserved by passing air containing carbon dioxide over alkali cyanides which are thus decomposed, and then passing the air charged with hydrocyanic acid through the chambers.

344,404. ACID INHIBITORS. J. H. Gravell, Elkins Park, Pa., U.S.A. Application date, October 26, 1929.

The action of acid on metal is inhibited by adding a condensation product of ammonia or an amine with an aldehyde or a derivative of thiocarbonic acid. The inhibitor is finely ground before adding to the acid, or may be dissolved in concentrated acid, acetone, alcohol, or ether, and is then precipitated on adding to the acid. Reference is directed by the Comptroller to Specifications Nos. 259,200 and 287,911.

344,409. DYES AND INTERMEDIATES. Imperial Chemical Industries, Ltd., Millbank, London. H. A. Piggott and E. H. Rodd, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, November 4, 1929.

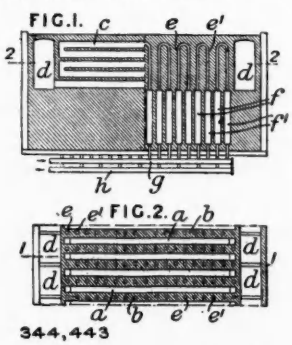
A diaryl-formamidine is treated with an equimolecular quantity of a cyclic ammonium compound having a reactive methyl group or a methylene base thereof in the presence of at least one molecular proportion of an acid either free or combined with the reactants. The products are intermediates for polymethine dyestuffs. In an example 2 : 3 : 3-trimethyl-indolenine-methiodide is condensed with diphenyl formamidine in the presence of acetic anhydride. Other examples are given.

344,419. ACID INHIBITORS. E. I. Du Pont de Nemours and Co., Wilmington, Del., U.S.A. International Convention date, June 21, 1929.

Corrosion in pickling baths or cleaning solutions containing sulphuric acid is inhibited by adding a product obtained by interaction of an aldehyde, an amine and carbon bisulphide. A number of inhibitors are described.

344,443. PYROLYSIS OF HYDROCARBONS. Naamlooze Vennootschap Silica en Ovenbouw Mij, 17, Raamweg, The Hague, and C. Otto, 54, Frühlingstrasse, Essen, Germany. Application date, November 27, 1929.

Methane is converted into aromatic and other hydrocarbons. Methane is passed through pipe *g* into heat exchanging chambers f^1 alternating with other chambers *f*. The preheated methane passes into the parts e^1 of the conversion chambers *b*, and is heated to about 1,040°–1,060° C. by the chambers *a*, which have horizontal heating flues *c* to which fuel is fed alternately from each side. The methane then passes to heat-exchanging chambers *f*, and finally to pipe *h* leading to a condenser. The apparatus is constructed of refractory ceramic material. The apparatus may be worked with coke oven gas, and details of the working are given, together with the combination with a coke oven plant.



344,443

344,449. ALIPHATIC KETONES. Holzverkohlungs-Industrie Akt.-Ges., Konstanz, Baden, Germany. International Convention date, January 25, 1929.

Acetone is made by the action of acetylene on steam at a raised temperature, and this exothermic reaction is combined with the non-exothermic production of acetone and other aliphatic ketones by the action of steam on aliphatic alcohols having two or more carbon atoms or on the aldehydes, acids or aliphatic esters derived from them. Catalysts such as oxygen compounds of iron, zinc or nickel, with promoters such as aluminium oxide, barium carbonate, lime or magnesia, may be used. The initial material may be the residual acetylene containing uncondensed acetaldehyde, water and acetic acid obtained in the production of acetaldehyde from acetylene.

344,470. HYDROCARBONS. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, 30, Carel van Bylandtlaan, The Hague. International Convention date, November 13, 1928.

Acetylene is converted into higher boiling hydrocarbons in the presence of an indifferent liquid such as paraffin, transformer oil, decahydronaphthalene or tetrahydronaphthalene with a catalyst such as finely divided iron or magnesium bromide.

344,479. ALIPHATIC KETONES. H. Dreyfus, 22, Hanover Square, London. Application date, November 28, 1929.

A mixture of vapour of a primary aliphatic alcohol containing at least two carbon atoms, and water vapour, is heated to 200°–700° C. in the presence of zinc or a zinc salt or compound such as zinc acetate, oxide or carbonate. In an example, a mixture of vapour of ethyl alcohol, steam and oxygen is passed over zinc acetate, or zinc oxide and calcium silicate at 475°–485° C., yielding acetone.

344,482. CATALYSTS. E. Berl, 40, Wilhelmstrasse, Darmstadt, Germany. International Convention date, November 30, 1928.

Catalysts for obtaining acetic anhydride from acetic acid vapour consist of copper, silver or their compounds associated with pumice, asbestos, biscuit porcelain or colloidal silica, or tungstic acid. The copper or silver compound may be precipitated on the silicious material, or may be mixed with yellow tungstic acid. The compounds may be partly reduced in the reaction. Several suitable catalysts are described.

344,492. METAL CHLORIDES AND SULPHATES. Meyer Mineral Separation Co., Empire Building, Pittsburg, U.S.A. Assignees of R. F. Meyer, Freeport, Pa., U.S.A. International Convention date, December 28, 1928.

Finely divided ore is treated with a gas such as sulphur dioxide, air, or chlorine, while sufficient liquid such as water or cyanide solution is added to keep it damp only, and allow free access of gas. Manganese silicate ores and nickel and cobalt ores may be treated by this method.

344,532. ORGANIC ARSENIC AND ANTIMONY COMPOUNDS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, February 21, 1929. Addition to 318,491.

Compounds of the formula $Y.Ar.NH.CO.(CH_2)_n.X$ in which Y represents a residue containing arsenic or antimony in a tri- or penta-valent form, X represents an amino group or a halogen atom, Ar represents a substituted or unsubstituted aryl residue, and *n* is an integer, are treated in known manner to exchange the hydroxyl group for X. In an example, arsanilic acid is treated with chloracetyl chloride and then caustic soda to obtain *p*-glycollyl-aminophenyl-arsinic acid.

Specifications Accepted with Date of Application

348,596. Protecting metals from the attack of acids, Process of. V. Bertleff. February 5, 1930. Addition to 293,701.

348,604. Catalytic vapour-phase oxidation of aromatic organic compounds. Selden Co. February 8, 1929.

348,632. Derivatives of phthalic acid, Production of. E. G. Beckett, P. F. Bangham, J. Thomas, and Scottish Dyes, Ltd. November 15, 1929.

348,640. Fertilizers, Production of. A. M. Clark, W. K. Hall, and Imperial Chemical Industries, Ltd. February 8, 1930.

348,651. Effecting reaction between solids and gases, Process of and apparatus for. Sulphur and Smelting Corporation. February 28, 1929.

348,661. Anthraquinone derivatives, Production and use of. E. G. Beckett, P. F. Bangham, J. Thomas, and Scottish Dyes, Ltd. November 12, 1929.

348,664. Treating ores and materials containing iron incombination with sulphur. Comstock and Wescott, Inc., and E. W. Wescott. November 18, 1929.

348,665. Treating iron ores. Comstock and Wescott, Inc., and E. W. Wescott. November 18, 1929. Addition to 306,107.

348,669. Contact sulphuric acid process. Selden Co. January 22, 1929.

348,671. Vat dyestuffs, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) December 18, 1929.

348,680. Azo dyestuffs, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) February 11, 1930.

348,682. Condensation products, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) February 12, 1930.

348,690. Catalysts for use in the manufacture, by destructive hydrogenation, of hydrocarbons from carbonaceous materials, Preparation of. I.G. Farbenindustrie Akt.-Ges. February 15, 1930. Addition to 247,585 and 247,584.

348,721. Coal, tars, oils, and the like carbonaceous materials, Manufacture of valuable products from. H. D. Elkington. (*Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij*) February 21, 1930.

348,724. Titanium preparations, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 21, 1930. Addition to 85,1930.

348,738. Purification and decoloration of solutions containing colloidal impurities. Maximine. February 25, 1929.

348,758. Dolomite and other natural carbonates of magnesium, Treatment of. Soc. de Produits Chimiques des Terres Rares. March 11, 1929.

348,761. Rubber compounding, Process for. Barrett Co. March 14, 1929.

348,764. Cracking hydrocarbons. Sinclair Refining Co. May 14, 1929.

348,776. Sodium hydrosulphite and pure zinc oxide or pure zinc carbonate, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) March 17, 1930.

348,789. Solid water-soluble aluminium salts of oxalic acid, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) March 24, 1930.

348,790. Aluminium salts of organic acids, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) March 24, 1930.

348,792. Electrolytic manufacture of chlorine. Westvaco Chlorine Products. January 27, 1930.

348,803. Destructive hydrogenation of high boiling hydro-carbons with the formation therefrom of hydrocarbons of lower boiling point. Gas Light and Coke Co., R. H. Griffith, and R. N. B. Bruce. March 29, 1930.

348,811. Azo dyestuffs insoluble in water, Manufacture of. W. W. Groves. (*I.G. Farbenindustrie Akt.-Ges.*). April 3, 1930.

348,817. Separation of olefines by distillation. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. June 5, 1929.

348,825. Alkali carbonates, Production of. Wintershall Akt.-Ges., C. T. Thorssell, and A. Kristensson. April 16, 1929. Addition to 300,629.

348,834. Lubricants, Production of. Standard Oil Development Co., May 17, 1929.

348,849. Vat dyestuffs of the anthraquinone series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. April 22, 1929.

348,866. Purification of sulphuric acid. W. W. Groves. (*I.G. Farbenindustrie Akt.-Ges.*). May 6, 1930.

348,889. Low boiling oils from higher boiling oils, Production of. Standard Oil Development Co. June 4, 1929.

348,902. Wool dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. August 17, 1929.

348,919. Electrodeposition of metals and alloys of the platinum group. W. W. Triggs. (*Baker and Co., Inc.*) June 13, 1930.

348,921. Easily soluble salts of 3-acetylamino 4-hydroxy-benzene-arsonic acid, Manufacture of. I.G. Farbenindustrie Akt.-Ges. June 14, 1929.

348,944. Concentration of aqueous formic acid. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) July 5, 1930.

348,956. Derivatives of 1-benzyl-3-methyliso-quinoline. G. B. Ellis. (*E. Merck, Firm of*). July 15, 1930.

348,960. Esters of cellulose or of its transformation products or of other carbohydrates, Manufacture of. I.G. Farbenindustrie Akt.-Ges. July 19, 1929. Addition to 301,036.

348,970. Diammonium phosphate, Production of. Kunstdunger Patent Verwertungs-Akt.-Ges. August 23, 1929.

348,985. Rubber, Manufacture of. Imperial Chemical Industries, Ltd. September 17, 1929.

348,986. Absorbing oxides of nitrogen. Lonza Elektrizitatswerke und Chemische Fabriken Akt.-Ges. September 14, 1929. Addition to 289,412.

348,988. β-Hydroxy derivatives of alkyl pyridines, Manufacture of. I.G. Farbenindustrie Akt.-Ges. October 21, 1929. Addition to 335,818.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

American Tar Products Co., Inc. Treatment of bituminous materials. 14,651. May 18. (United States, December 6, 1930.)

Anderson, I. B., Thomson, R. F., Carter, P. G., and Imperial Chemical Industries, Ltd. Production of benzanthrone derivatives. 14,816. May 19.

Arnold, C., and Dow Chemical Co. Manufacture of alkali metal acetates. 14,658. May 18

Bailey, F. Separating solids from liquids. 15,183. May 22.

Bampfylde, J. W. Catalytic treatment of hydrocarbons. 14,913. May 20. (April 1.)

Berry, A. G. V., and Blair, S. M. Treatment of waste products in refining of hydrocarbon material. 14,661, 14,662. May 18.

—— Treatment of mineral oil fractions. 14,663. May 18.

Blumenfeld, J. Chemical manufacture. 15,306. May 23. (France, May 24, 1930.)

Böhme Akt.-Ges., H. T. Production of higher aliphatic alcohols. 14,933. May 20. (Germany, July 18, 1930.)

—— Production of agents for increasing capillarity. 14,934. May 20. (Germany, July 21, 1930.)

—— Production of sulphonated higher alcohols. 14,935. May 20. (Germany, August 6, 1930.)

Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Textile printing. 14,899. May 20.

—— Protecting wool, etc., against textile pests. 15,227. May 22.

—— Manufacture of higher amines. 15,309. May 23.

Casson, S. B., Chemical and Metallurgical Corporation, Ltd., and Crabtree, J. W. Manufacture of hydrochloric acid. 15,046. May 21.

Coley, H. E. Extraction of volatile metals from their ores, etc. 15,018. May 21.

—— Separation of metals from ores, etc. 15,151. May 22.

—— Reduction of ores, etc. 15,152. May 22.

Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Cold asphalt, and application thereof. 14,792. May 19.

—— Manufacture of azo dyestuffs. 15,159, 15,160. May 22.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of polymerization products. 14,634. May 18.

—— and Johnson, J. Y. Production of products of anthrapyrimidine series. 14,635. May 18.

—— and Johnson, J. Y. Production of molybdenum. 14,636. May 18.

I.G. Farbenindustrie Akt.-Ges. Manufacture of vat dyestuffs. 14,642. May 18. (Germany, May 19, 1930.)

—— Manufacture of splinterless glass. 15,043. May 21. (Germany, May 21, 1930.)

—— Manufacture of water-soluble aromatic-aliphatic diazoamino compounds. 15,064. May 21. (Germany, May 24, 1930.)

Imperial Chemical Industries, Ltd., Wilson, J. S., and Macqueen, S. T. Production of dyestuff preparations. 14,814. May 19.

—— Wetting, etc., agents. 14,815. May 19.

Isco Chemical Co., Inc., and Triggs, W. W. Making bleaching powder. 15,307. May 23.

Jackson, F. H. Separating solids from liquids. 15,183. May 22.

Lantz, R., and Soc. Anon. des Matières Colorantes et Produits Chimiques de Saint-Denis. Manufacture of azo-dyestuffs containing sulphur. 14,908. May 20. (France, June 19, 1930.)

—— Manufacture of azo-dyestuffs containing sulphur. 14,909. May 20. (France, June 20, 1930.)

—— Manufacture of azo-dyestuffs containing sulphur. 14,910. May 20. (France, June 21, 1930.)

Lavender Bros. and Co. (Dehydrations), Ltd. Manufacture of material containing calcium chloride. 14,794. May 19.

Maxted, E. B. Hydrogentaion catalysts. 14,825. May 20.

Mentzel, A. Production of ammonia, soda, etc., from salt and coal. 14,809. May 19. (Germany, May 19, 1930.)

Nielsen, H., and Sensible Heat Distillation, Ltd. Distillation of solid carbonaceous materials. 14,016. May 21.

Schering-Kahlbaum Akt.-Ges. Manufacture of camphene. 14,687. May 18. (Germany, May 26, 1930.)

Shell Oil Co. Refining hydrocarbon oils. 15,059. May 21. (United States, September 29, 1930.)

Sherman, A. E. Manufacture of material containing calcium chloride. 14,974. May 19.

Soc. of Chemical Industry in Basle. Manufacture of diazo preparations. 15,044, 15,045. May 21. (Switzerland, May 21, 1930.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£18 15s. per ton d/d address U.K. in casks.
ACID CHROMIC.—1s. per lb., less 2½% d/d U.K.
ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.
ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.
ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
AMMONIA (ANHYDROUS).—Spot, 10d. per lb., d/d in cylinders.
AMMONIUM BICHROMATE.—8½d. per lb. d/d U.K., or 8d. c.i.f. export
BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.
BLEACHING POWDER, 35/37%.—Spot, £7 19s. per ton d/d station in casks, special terms for contracts.
BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags. carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards.)
CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d station in drums.
CHROMIUM OXIDE.—9d. to 9½d. per lb. according to quantity d/d U.K.
CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 12s. 6d. per ton d/d U.K.
COPPER SULPHATE.—£25 to £25 10s. per ton.
METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 11d. to 2s. 4d. per gall.; pyridinised industrial, 2s. 1d. to 2s. 6d. per gall.; mineralised, 3s. to 3s. 4d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.
NICKEL SULPHATE.—£38 per ton d/d.
NICKEL AMMONIA SULPHATE.—£38 per ton d/d.
POTASH CAUSTIC.—£30 to £33 per ton.
POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity: ground ½d. per lb. extra.
POTASSIUM CHLORATE.—3¾d. per lb. ex-wharf, London, in cwt. kegs.
POTASSIUM CHROMATE.—8½d. per lb. d/d U.K., or 8d. c.i.f. export.
SALAMMONIAC.—Firsts lump, spot, £40 17s. 6d. per ton d/d address in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.
SALT CAKE, UNGROUND.—Spot, £3 10s. per ton d/d station in bulk.
SODA ASH, 58%.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.
SODA CAUSTIC, SOLID, 76/77° E.—Spot, £14 10s. per ton, d/d station.
SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.
SODIUM ACETATE 97/98%.—£21 per ton.
SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.
SODIUM BICHROMATE CRYSTALS (CAKE AND POWDER)—3½d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.
SODIUM BISULPHITE POWDER, 60/62%.—£16 10s. per ton delivered 1-cwt. iron drums for home trade.
SODIUM CHLORATE.—2¾d. per lb.
SODIUM CHROMATE.—3⅝d. per lb. d/d U.K., or 3½d. c.i.f. export.
SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.
SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.
SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.
SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d.
SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton, d/d in free drums. Crystals—Spot, £8 5s. per ton, d/d in free casks.
SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—5d. to 6¼d. per lb. Crude 60's 1s. to 1s. 1d. per gall. August/December.
ACID CRESYLIC 99/100.—1s. 9d. to 1s. 10d. per gall. B.P., 3s. 6d. per gall. 97/99.—Refined, 2s. 2d. to 2s. 3d. per gall. Pale, 98%, 1s. 8d. to 1s. 9d. Dark, 1s. 4d. to 1s. 4½d.
ANTHRACENE OIL, STRAINED (GREEN OIL).—4½d. to 4¾d. per gall.
BENZOLE.—Prices at works: Crude, 6½d. to 7½d. per gall.; Standard Motor, 1s. 1d. to 1s. 2d. per gall. 90%.—1s. 2d. to 1s. 3d. per gall. Pure, 1s. 5d. to 1s 6d. per gall.
TOLUOLE.—90%, 1s. 9d. to 1s. 10d. per gall. Pure, 1s. 10d. to 1s. 11d. per gall.
XYLOL.—1s. 8d. to 1s. 9d. per gall. Pure, 1s. 10d to 1s. 11d. per gall.
CREOSOTE.—Standard specification, for export, 5dd. to 5¼d. net per gall. f.o.b.; for Home, 4d. per gall. d/d.
NAPHTHA.—Solvent, 90/160, 1s. 3d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent, 90/190, 1s. to 1s. 2d. per gall.
NAPHTHALENE.—Purified Crystals, £11 11s. per ton.
PITCH.—Medium soft, 45s. per ton, in bulk at makers' works.
PYRIDINE.—90/140, 3s. 3d. to 3s. 6d. per gall. 90/160, 3s. 3d. to 3s. 6d. per gall. 90/180, 1s. 9d. to 2s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.
ACID ANTHRANILIC.—6s. per lb. 100%.
ACID GAMMA.—Spot, 3s. 3d. per lb. 100% d/d buyer's works.
ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
ACID NAPHTHIONIC.—1s. 2d. per lb. 100% d/d buyer's works.
ACID NEVILLE AND WINTHER.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.
ACID SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.
ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
BENZIDINE BASE.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.
o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1-ton lots.
m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.
p-CRESOL 34·5° C.—1s. 9d. per lb., in ton lots.
DICHLORANILINE.—2s. 5d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
DINITROBENZENE.—7½d. per lb.
DINITROCHLORBENZENE.—£74 per ton d/d.
DINITROTOLUENE.—48/50° C., 7d. per lb.; 66/68° C., 7¾d. per lb.
DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer s works.
a-NAPHTHOL.—Spot, 1s. 9d. per lb. d/d buyer's works.
B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.
a-NAPHTHYLAMINE.—Spot, 10½d. per lb. d/d buyer's works.
B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.
o-NITRANILINE.—5s. 11d. per lb.
m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.
NITRONAPHTHALENE.—8½d. per lb.
R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.
SODIUM NAPHTHIONATE.—Spot, 1s. 6d. per lb. 100% d/d buyer's works.
o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.
p-TOLUIDINE.—Spot, 1s. 6d. per lb. d/d buyer's works.
m-XYLIDINE ACETATE.—3s. 3d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 5s. to £7 10s. per ton. Grey, £13 per ton. Liquor, 9d. per gall.
ACETONE.—£63 to £65 per ton.
CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.
IRON LIQUOR.—24°/30° Tw., 10d. to 1s. 2d. per gall.
RED LIQUOR.—16° Tw., 8½d. to 10d. per gall.
WOOD CREOSOTE.—1s. 9d. per gall., unrefined.
WOOD NAPHTHA, MISCIBLE.—2s. 9d. to 2s. 11s. per gall., according to quantity. Solvent, 3s. 9d. per gall.
WOOD TAR.—£4 to £5 per ton.
BROWN SUGAR OF LEAD.—£32 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 1d. per lb according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.
ARSENIC SULPHIDE, YELLOW.—1s. 7d. to 1s. 9d. per lb.
BARYTES.—£6 to £7 10s. per ton, according to quality.
CADMIUM SULPHIDE.—4s. 6d. to 5s. per lb.
CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.
CARBON BLACK.—3d. to 4d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity: drums extra.
CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 6d. per lb.
INDIARUBBER SUBSTITUTES, WHITE.—4⅝d. to 5⅛d. per lb.; Dark, 4⅛d. to 4⅞d. per lb.
LAMP BLACK.—£28 per ton, barrels free.
LITHOPONE, 30%.—£19 to £21 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
VERMILION, PALE OR DEEP.—6s. 6d.–7s. per lb.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACETANILIDE.—1s. 4½d. to 1s. 6d. per lb.
ACID, ACETIC, PURE, 80%.—£37 5s. per ton d/d address U.K. in casks.
ACID, ACETYL SALICYLIC.—2s. 7d. to 2s. 9d. per lb., according to quantity.
ACID, BENZOIC B.P.—1s. 10d. per lb., for synthetic product. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—11¾d. per lb., less 5%.
ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. for 28-lb. lots.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—11½d. per lb., less 5%.
AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.
AMMONIUM BENZOATE.—3s. 6d. per lb.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.
ARGENT. NITRAS, CRYSTALS.—1s. 1d. per oz.
ATROPHINE SULPHATE.—7s. to 7s. 6d. per oz., according to quantity.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—2s. 10d. per lb.
BISMUTH CARBONATE.—7s. 3d. per lb.
BISMUTH CITRATE.—8s. 4d. per lb.
BISMUTH SALICYLATE.—7s. 7d. per lb.
BISMUTH SUBNITRATE.—6s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 5s. 4d. per lb.
BISMUTH OXIDE.—10s. 4d. per lb.
BISMUTH SUBCHLORIDE.—10s. per lb.
BISMUTH SUBGALLATE.—7s. 6d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb. Liquor Bismuth B.P., in W. Qts., 1s. 2d. per lb.; 6 W. Qts., 11½d. per lb.; 12 W. Qts., 10d. per lb.; 36 W. Qts. 9½d. per lb.
BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 4½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 7d. per lb. Prices for 1-cwt. lots.
CAFFEIN, PURE.—6s. 6d. per lb.
CAFFEIN CITRAS.—5s. per lb.
CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., according to quantity.
CAMPHOR.—Refined flowers, 2s. 10d. to 3s. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—2s. 11½d. to 3s. 1½d. per lb.
CHLOROFORM.—2s. 3d. per lb., according to quantity.
EPHEDRINE, PURE.—12s. 6d. to 13s. 6d. per oz.
ERGOSTEROL.—2s. 6d. per gm.
ETHERS.—S.G. ·730—1s. 1d. to 1s. 2d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—30s. per cwt., in barrels, ex wharf.
GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.
HEXAMINE.—1s. 10d. to 2s. per lb., according to quantity.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; for 28-lb. lots.
IRON AMMONIUM CITRATE.—B.P., 1s. 9d. per lb., for 28-lb. lots. Green, 2s. 6d. per lb., list price. U.S.P., 2s. 7d. per lb. list price.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8¼d. to 8¾d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light B.P., 36s. per cwt.
MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 14s. 6d. per lb. net; Synthetic, 8s. 6d. to 12s. per lb.; Synthetic detached crystals, 8s. 6d. to 10s. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.
PARAFORMALDEHYDE.—1s. 6d. per lb.
PARALDEHYDE.—1s. 1d. per lb.
PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
PHENOLPHTHALEIN.—5s. to 5s. 2½d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—82s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P., 1s. 7d. per lb. for 28-lb. lots.
POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.
POTASSIUM IODIDE.—16s. 8d. to 17s. 9d. per lb., as to quantity.
POTASSIUM METABISULPHITE.—50s. per cwt. d/dLondon, kegs free.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.
SACCHARIN.—43s. 6d. per lb.
SALICIN.—16s. 6d. to 17s. 6d. per lb., according to quantity.
SANTONIN.—£50 per kilo for 5-kilo lots.
SILVER NITRATE.—10d. per oz. for 500-oz. lots, sticks, 2d. per oz. extra.
SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.
SODIUM BENZOATE B.P.—1s. 6½d. to 1s. 7½d. per lb.
SODIUM CITRATE.—B.P.C. 1911, 1s. 4d. per lb. B.P.C. 1923, and U.S.P., 1s. 8d. per lb. for 28-lb. lots.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. per cwt. net, ton lots, d/s of 5 cwt. Crystals, 2s. 6d. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£26 to £28 per ton, according to quantity. Delivered U.K.
STRYCHNINE, ALKALOID CRYSTAL, 2s. per oz.; hydrochloride, 1s. 9½d. per oz.; nitrate, 1s. 8d. per oz.; sulphate, 1s. 9d. per oz., for 1,000-oz. quantities.
TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
THYMOL.—Puriss, 6s. 1½d. to 7s. per lb., according to quantity. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—9s. per lb.
AMYL ACETATE.—2s. 3d. per lb.
AMYL BUTYRATE.—4s. 9d. per lb.
AMYL CINNAMIC ALDEHYDE.—9s. per lb.
AMYL SALICYLATE.—2s. 6d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 9d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 9d. per lb.
BENZYL BENZOATE.—2s. 2d. per lb.
CINNAMIC ALDEHYDE NATURAL.—11s. 9d. per lb.
COUMARIN.—12s. per lb.
CITRONELLOL.—6s. 6d. per lb.
CITRAL.—6s. 6d. per lb.
ETHYL CINNAMATE.—6s. 9d. per lb.
ETHYL PHTHALATE.—2s. 6d. per lb.
EUGENOL.—8s. 6d. per lb.
GERANIOL.—6s. to 10s. per lb.
HELIOTROPINE.—5s. 6d. per lb.
ISO EUGENOL.—10s. 6d. per lb.
LINALYL ACETATE, EX BOIS DE ROSE.—7s. 6d. per lb. Ex Shui Oil, 7s. 6d. per lb.
METHYL ANTHRANILATE.—6s. 3d. per lb.
METHYL BENZOATE.—4s. 3d. per lb.
MUSK XYLOL.—6s. 6d. per lb.
PHENYL ETHYL ACETATE.—10s. per lb.
PHENYL ETHYL ALCOHOL.—8s. 3d. per lb.
RHODINOL.—40s. per lb.
SAFROL—1s. 6d. per lb.
VANILLIN, EX CLOVE OIL.—14s. 6d. to 16s. 6d. per lb. Ex Guaiacol.—13s. to 15s. per lb.

Essential Oils

ANISE OIL.—2s. 6d. per lb.
BERGAMOT OIL.—8s. 3d. per lb.
BOURBON GERANIUM OIL.—17s. 6d. per lb.
CAMPHOR OIL.—White, 2s. per lb.; Brown, 1s. 6d. per lb.
CANANGA.—Java, 8s. per lb.
CINNAMON OIL LEAF.—4s. 6d. per oz.
CITRONELLA OIL.—Java, 2s. 2d. per lb., c.i.f. Pure Ceylon, 2s. per lb.
CLOVE OIL, 90/92%.—6s. 6d. per lb.
EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%—1s. 7d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, 9s. per lb.
LEMON OIL.—4s. per lb.
LEMONGRASS OIL.—3s. 1½d. per lb.
OTTO OF ROSE.—Anatolian, 45s. per oz.; Bulgarian, 65s. per oz.
PALMA ROSA.—9s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 8s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, June 4, 1931.

A SLIGHTLY better enquiry for general chemicals has been received during the past week. Markets generally show little variation and move along quietly steady lines.

General Chemicals

ACETONE.—Conditions in this market are unchanged, there being a fair amount of business transcated, and price steady at £60 to £65 per ton, according to quantity.

ACID, ACETIC.—Continues to meet with a steady demand, with price for technical 80% unchanged at £36 5s., to £38 5s., and pure 80% £37 5s. to £39 5s. per ton, according to quantity.

ACID, CITRIC.—No improvement in the price can be reported, the market being easy at about 1s. 0½d. per lb. less 5%. There is, however, rather a better demand.

ACID, FORMIC.—Unchanged at about £38 per ton.

ACID, LACTIC.—Is receiving a fair amount of attention with the 50 per cent. by weight pale technical quality quoted at £39 per ton.

ACID, OXALIC.—The price is higher at £34 per ton, with conditions very firm. Enquiry has been brisk.

ACID, TARTARIC.—Price continues steady at about 11½d. per lb. less 5%, with rather a larger demand.

ALUMINA, SULPHATE.—Has been in better request, with price firm at £7 15s. to £8 5s. per ton for the 17/18% iron free quality.

ARSENIC.—Cornish material is still scarce for early delivery, and price is firm at £19 to £19 10s. per ton. Continental material is offering in better supply, with price steady.

CREAM OF TARTAR.—Demand is increasing, with the price steady at 80s. to 81s. per cwt., ex warehouse London.

COPPER SULPHATE.—Rather more activity is being shown in this product, especially from Overseas markets. Price is steady, at about £21 to £21 10s. per ton less 5%, free on rails London.

FORMALDEHYDE.—In good request at about £29 per ton.

LEAD ACETATE.—Unchanged at £32 5s. per ton for white, and £31 5s. per ton for brown, with a small demand.

LEAD NITRATE.—Steady at £28 10s. per ton.

LITHOPONE.—A fair amount of enquiry is being received with the price unchanged at £18 to £22 per ton according to quantity and grade.

POTASSIUM BICHROMATE.—Is in steady demand at 4¼d. per lb.

POTASSIUM CHLORATE.—Continues a firm market at £28 to £32 per ton according to quantity and in fairly good request.

PERMANGANATE OF POTASH.—Is in steady demand at 5¼d. to 5½d. per lb., ex warehouse for the B.P. needle crystals.

SODIUM BICHROMATE.—Unchanged at 3½d. per lb. and in steady demand.

SODIUM HYPOSULPHITE.—Photographic crystals are in good demand at £14 5s. per ton. Commercial quality is quoted at about £8 10s. with a small business being done.

SODIUM PRUSSIATE.—Continues steady at 4¾d. to 5¼d. per lb.

TARTAR EMETIC.—Unchanged at about 10¾d. per lb.

ZINC SULPHATE.—Steady at about £10 10s. per ton.

Coal Tar Products

THERE is no material change in the coal tar products market, although there is a tendency to hardening of prices.

MOTOR BENZOL.—Quoted at about 1s. 4½d. to 1s. 5½d. per gallon f.o.r.

SOLVENT NAPHTHA.—Is worth about 1s. 1½d. to 1s. 2d. per gallon f.o.r.

HEAVY NAPHTHA.—Unchanged at 11d. to 1s. 0½d. per gallon f.o.r.

CREOSOTE OIL.—Obtainable at about 3d. to 3½d. per gallon f.o.r. in the North, and at 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Quoted at about 1s. 8d. per gallon for the 98/100% quality, and at about 1s. 6d. per gallon for the dark quality 95/97%.

NAPHTHALENES.—Are worth about £3 10s. to £3 15s. per ton for the firelighter quality, about £4 to £4 5s. per ton for the 74/76 quality, and about £5 per ton for the 76/78 quality.

PITCH.—Quoted at 35s. to 37s. 6d. per ton, f.o.b. East Coast port, for forward delivery.

THE following additional prices have been supplied to us:—

Carbolic Acid.—Business is a little better since my last report, and prices to-day are unchanged at those as previously quoted.

Vanillin.—Schedule remains unaltered. Genuine clove oil vanillin is quoted at 14s. 6d. to 16s. 6d. per lb., according to quantity. The scale of prices for guaiacol vanillin is 1s. 6d. per lb. less.

Motor Benzol.—Is down in sympathy with petrol, and in the North we estimate prices at about 1s. 4¼d. to 1s. 5d. per gallon.

Sodium Salicylate.—Is unchanged at current rates.

Cresylic Acid.—Business is steady without any change in rates. Pale 99/100% is 1s. 10d. to 2s.; 97/99%, 1s. 6d. to 1s. 7d. American cresylic acid has rather a better market.

Nitrogen Fertilisers

Sulphate of Ammonia.—Export.—The market continues quiet but the price remains unchanged at £7 per ton f.o.b. U.K. port in single bags, for neutral quality 20·6% nitrogen. *Home.*—Merchants report that the demand for immediate consumption is now definitely over, and only very small orders reach them. The home price of £9 10s. per ton remains in operation until June 30.

Nitrate of Soda.—Scale prices remain in operation until June 30. It is understood that the demand for immediate consumption has practically ceased.

Latest Oil Prices

LONDON, June 3.—LINSEED OIL was steady and 2s. 6d. per ton higher. Spot, ex mill, £15 10s.; June, £13 12s. 6d.; July-August £13 15s.; September-December, £14 10s.; January-April, £15 7s. 6d. naked. RAPE OIL was inactive. Crude extracted, £27 10s.; technical refined, £29, naked, ex wharf. COTTON OIL was quiet. Egyptian, crude, £17 10s.; refined common edible, £20 10s.; deodorized, £22 10s., naked, ex mill. TURPENTINE was steady. American, spot, 46s. 3d.; July-December, 46s. 9d. per cwt.

HULL.—LINSEED OIL, naked, spot, to August, closed at £14 per ton; September-December, £14 7s. 6d.; January-August, £15 5s. COTTON OIL.—Bombay crude, spot, unquoted; Egyptian crude, spot, £17 5s.; edible refined, spot, £19 15s.; technical, spot, £19 10s., deodorized, £21 15s.; CASTOR OIL.—Pharmacy, spot, 38s.; firsts, 33s.; seconds, 31s. per cwt. PALM KERNEL OIL.—Crude, naked, f.m.q., spot, £19. GROUNDNUT OIL.—Crushed-extracted, spot, £22 10s.; deodorized, £26 10s. SOYA OIL.—Crushed-extracted, spot, £17 10s.; deodorized, £21. RAPE OIL.—Crushed-extracted; spot, £27; refined, £29 per ton. COD OIL, spot, 20s. per cwt.

South Wales By-Products

THERE is very little change to report in South Wales by-product activities. Pitch continues to have a slow and sporadic market, most big users confining their purchases to small parcels for immediate requirements. Quotations are unchanged. There is a fair and steady call for road tar, with quotations steady round about 13s. per 40-gallon barrel. Refined tars are in fair request, with quotations for coke-oven and gasworks tar unchanged. Naphthas continue to have a slow and uncertain market, with values for solvent and heavy unchanged. Creosote has a slightly better market, while motor benzol is also fairly strong. Patent fuel and coke exports continue to be unsatisfactory. Patent fuel prices, for export, are:—20s. 6d. to 21s., ex-ship, Cardiff; 19s. 6d. to 20s., ex-ship, Swansea. Coke prices are:—Best foundry, 34s. to 36s. 6d.; good foundry, 22s. 6d. to 25s.; furnace, 16s. 6d. to 17s. 6d.

Scottish Coal Tar Products

FEW changes have been made during the week although there exists, a better feeling as regards the future. In certain cases distillers are quoting higher prices, but the demand does not justify this at present.

Cresylic Acid.—Value is steadier although inquiries remain spasmodic. Pale, 99/100%, 1s. 5d. to 1s. 6d. per gallon; pale, 97/99%, 1s. 3d. to 1s. 4d. per gallon; dark, 97/99%, 1s. 2d. to 1s. 3d. per gallon; high boiling, 1s. 9d. to 1s. 10d. per gallon; all f.o.r. works.

Carbolic Sixties.—Outlet is restricted and value is nominal at 1s. 1d. to 1s. 3d. per gallon according to water content.

Creosote Oil.—Trading continues fair and prices are steady. Specification oils, 2½d. to 3d. per gallon; gas works ordinary, 3½d. to 3¾d. per gallon; washed oil, 3¼d. to 3½d. per gallon; all ex works, in bulk.

Coal Tar Pitch.—Some inquiries for delivery next season are in circulation, but makers are not anxious sellers. Home value is 35s. to 37s. 6d. per ton at works, while export is about 37s. 6d. per ton f.o.b. Glasgow.

Blast Furnace Pitch.—Dull at controlled prices of 30s. per ton f.o.r. works for home trade, and 35s. per ton, f.a.s. Glasgow for export.

Refined Coal Tar.—Stocks are lower but value remains easy at 2¼d. to 2¾d. per gallon f.o.r. in buyers' packages.

Blast Furnace Tar.—Fixed price remains at 2¾d. per gallon.

Crude Naphtha.—Supplies are not plentiful and 4¼d. to 5¼d. per gallon ex works is obtainable for best grades.

Water White Products.—Orders are remarkably scarce for all tar spirits. Motor benzol is about 1s. 4d. to 1s. 5d. per gallon; 90/160 solvent, 1s. 3d. to 1s. 4d. per gallon; 90/190 heavy solvent, 1s. 1d. to 1s. 2d. per gallon; all ex makers' works.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, June 2, 1931.

AN improvement in the export and home business is reported from the Scottish heavy chemical market.

Industrial Chemicals

ACETONE.—B.G.S.—£60 to £63 per ton, ex wharf, according to quantity.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £47 to £58 per ton; pure, £37 5s. per ton; technical, 80%, £36 5s., delivered in minimum lots of 1 ton.

ACID, BORIC.—Granulated commercial, £22 per ton; crystals, £23 per ton; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1-cwt. bags, delivered Great Britain free in one-ton lots upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads.

ACID, OXALIC.—98/100%.—On offer at 3¼d. per lb., ex store. On offer from the Continent at 3¾d. per lb., ex wharf.

ACID, SULPHURIC.—£3 7s. 6d. per ton, ex works, for 144° quality, £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC, B.P. CRYSTALS.—Quoted 1s. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 11⅜d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted round about £8 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 10s. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10½d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 80°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £24 per ton, ex wharf. On offer for shipment from China at about £23 per ton, c.i.f. U.K.

ARSENIC, WHITE POWDERED.—Quoted £22 10s. per ton, ex wharf Spot material still on offer at £22 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £9 10s. per ton, c.i.f. U.K. ports. For Continental materials our price would be £8 10s. per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 7s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £30 10s. per ton, ex store. Continental on offer at about £29 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £30 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £38 per ton, carriage paid.

LEAD ACETATE.—White crystals quoted round about £33 to £34 per ton c.i.f. U.K. ports. Brown on offer at about £1 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £9 10s. per ton, ex store.

METHYLATED SPIRIT.—Industrial quality 64 o.p. quoted 1s. 8d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4¼d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £25 10s. per ton ex store. Offered from the Continent at £24 15s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99⅔/100% POWDER.—Quoted £27 15s. per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb. ex wharf.

SODA CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums; all carriage paid buyer's station, minimum four-ton lots; for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3½d. per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 7s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £10 per ton, carriage paid, buyer's sidings, minimum six-ton lots.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Price, 60s. per ton, ex works; 65s. per ton, delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £8 10s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £18 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

A Refinement in Pulverising Mills

MILLS which pulverise materials by shattering and ejection, instead of by grinding and retention, are supplied by Mayhew, Ramsay and Co., Ltd., of 75, Victoria Street, London, S.W.1. In these so-called "Miracle" mills the grinding elements are composed of a battery of loose, swinging hammers, held in position by bolts on discs, which are assembled on the mill shaft. When the mill is in operation, the material is shattered in mid-air, and not by grinding between two surfaces of pressure. By reason of this swinging hammer principle, friction such as is found in other mills is eliminated. The hammers have twelve cutting edges, all of which are brought into play during the operation of the mill, the working ends being changed automatically each time the mill is stopped. Further, when after long service one side at each end has become worn, the carrying bolts can be quickly removed, and the hammers reversed, thus putting to service the unused side.

Water-Gas Plant Efficiency

A STUDY of the carbon and thermal balances of the water-gas process has been published by the Department of Scientific and Industrial Research, as *Fuel Research Technical Paper No.* 30 (H.M. Stationery Office, price 9d. net). This paper, which is by J. G. King and B. H. Williams, incorporates the result of work carried out at the Fuel Research Station, and details the procedure to be adopted in preparing complete balance sheets showing the distribution of the carbon entering the plant, the amounts of heat generated in the process, and its utilisation. This report should be welcomed by both builders and users of water-gas plant, in view of the fact that the commercial use of water-gas, as a fuel and as a source of hydrogen, is rapidly extending.

Exemption of Diphenyl Oxide

A REPRESENTATION has been made to the Board of Trade under Section 10 (5) of the Finance Act, 1926, regarding the exemption of diphenyl oxide from the duty imposed by Sec. 1 of the Safeguarding of Industries Act, 1931, as amended by the Finance Act. Any communication relating to the matter should be addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, S.W.1, within one month from the date of this notice (May 22).

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, June 4, 1931.

After a holiday spell which virtually brought business to a standstill on the chemical market here last week business has opened on a moderately active scale with, in the majority of instances, deliveries against contracts to textile dyeing and finishing works maintained at about the level prevailing before Whitsun. With regard to prices, while the majority of products keep reasonably steady, the tendency in the case of the non-ferrous metal compounds is distinctly uncertain and in respect of these lines users are doing little more than covering early requirements.

Heavy Chemicals

There is a moderate movement of bichromate of soda, values of which are well held on the basis of 3½d. per lb., less 1 to 2½ per cent. discount, according to quantity. Caustic soda is meeting with a fair volume of inquiry, principally against contract commitments, basic prices ranging from £12 15s. to £14 per ton, according to grade. The demand in the case of sulphide of sodium has been on rather quiet lines during the past week and quotations are not too strong; the 60-65 per cent. concentrated solid quality is offering in the region of £9 per ton and the commercial material at about £8. There has been little change in the price position of chlorate of soda, a quiet business being reported at round £26 5s. per ton. Saltcake is quoted to-day at from £2 15s. to £3 per ton, with inquiry in this section on moderate lines. A quietly steady demand has been experienced for prussiate of soda, which keeps firm at from 4¾d. to 5¼d. per lb,, according to quantity. The demand for diphosphate of soda is on the slow side, but prices keep up at about £10 10s. per ton. With regard to alkali, this is meeting with a fair amount of inquiry and values are firm at about £6 per ton. Bicarbonate of soda is attracting a moderate amount of buying interest and there has been no change in the price position, offers being in the neighbourhood of £10 10s. per ton. Hyposulphite of soda is in quiet call, with the photographic material at £15 5s. per ton and the commercial grade at £9 5s.

Only a very moderate inquiry has been experienced this week in the case of chlorate of potash, though prices of this material keep up at about £27 10s. per ton. Permanganate of potash is moving in relatively small quantities, with the B.P. quality quoted at about 5½d. per lb. and the commercial grade at 5¼d. Carbonate of potash has been offering at somewhat lower rates, round £24 10s. per ton being the current basis. Yellow prussiate of potash meets with a moderate inquiry and values are firm at from 6¾d. to 7¼d. per lb., according to quantity. Bichromate of potash is in fair request and prices are held on the basis of 4¼d. per lb., less discounts of from 1 to 2½ per cent. Caustic potash is fairly steady at £28 10s. per ton, but only a relatively quiet demand for this material is reported.

A quiet trade is going through in the case of arsenic, offers of which maintain a steady course at round £19 5s. per ton at the mines for white powdered, Cornish makes. Sulphate of copper is easy and uncertain and not much business is going through; values are at round £18 10s. per ton, f.o.b. Uncertainty also characterises the market for the lead products, nitrate selling in limited quantities at about £29 per ton and white and brown acetate at £32 and £31. The acetates of lime show very little alteration since last report, the grey material being on offer at round £12 5s. per ton and the brown at £7 5s.

Acids and Tar Products

Further easiness has developed in citric acid, values to-day being no better than a top figure of 1s. per lb. Tartaric is in quiet demand and there has been no further alteration in respect of prices, offers being at round 11¼d. per lb. Acetic acid keeps firm and meets with a moderate demand at about £51 per ton for the technical glacial and £37 for the 80 per cent. commercial. Oxalic acid is dearer at about £1 14s. per cwt.

Most sections of the by-products market are slow. Pitch is quoted at 37s. per ton, f.o.b., for the "outside" makes, with creosote oil on offer at from 3d. to 3¾d. per lb., according to grade. Solvent naphtha is only in moderate demand at 1s. 2d. per gallon, naked. Carbolic acid is maintained at round 1s. 2d. per gallon for crude 60's, and 5¼d. per lb. for crystals.

Company News

Amalgamated Zinc (de Bavays).—For the half year ended December 31, a profit of £7,371 is reported, to which is added £896, which remained after payment of the first half-year's dividend, making £8,267 to be carried forward.

Scottish Oils, Ltd.—The report for the year to March 31 last shows that the balance at the credit of profit and loss account, including £66,489 brought in, and after providing for depreciation and writing off £120,000 to account of losses in subsidiary companies, is £180,926. The preference dividend for the year absorbs £160,763, leaving £20,163 to be carried forward.

Tarapaca and Tocopilla Nitrate Co., Ltd.—A gross loss of £24, 593, against a profit of £118,783 in the previous year, is shown in the report for 1930 of the Tarapaca and Tocopilla Nitrate Co., Ltd., which recently announced that a provisional agreement for the sale of its assets to "Cosach" had been reached. After adding expenses, interest and stoppage costs, etc., there is a deficit to go forward of £73,466. In 1929, a dividend of 5 per cent. was paid.

Internationale Gesellschaft fur Chemische Unternehmungen A.G., Basle.—The annual report of this company, which is closely associated with the I.G. Farbenindustrie A.G., shows a net profit of 16,902,000 f. In the balance sheet the amount of participations and securities is shown at 94,027,874 f. Bank balances amount to 38,043,917 f., and sundry debtors of this concern 125,582,935 f. The paid up capital is 144,000,000 f.; reserves amount to 100,000,000 f.

Cape Asbestos Co., Ltd.—For the year 1930 the report shows that the total income for the twelve months was £55,876, against £72,619 in 1929, while after charging expenses and depreciation, the net profit fell from £39,382 to £26,211. The ordinary shares, on which no interim was paid, are to receive 5 per cent., against a total of 15 per cent., and the preference payment is therefore brought up to 10 per cent., compared with 20 per cent., leaving £21,165 to go forward, against £13,704 brought in.

Anglo-Persian Oil Co.—For the year 1930, the profits amount to £4,648,579, to which is added the sum of £686,064 which was brought forward. After providing for extra depreciation £487,217, discount on debentures £13,000, and the allocation of £550,000 to the several reserve funds and £500,000 to reserve for taxation, the directors recommend a final dividend of 10 per cent., less tax, on the ordinary shares, making 15 per cent. for the year (20 per cent. previous year), and to carry forward £896,675.

Einstein's Electro Chemical Process, Ltd.—The report for 1930 shows a loss for the year of £38,454, increasing the debit balance at profit and loss to £60,008. The directors further state that the depreciation of capital is greater than the loss on operations, but that nothing is to be gained by attempting to deal with this depreciation until the results of the measures outlined in the report are known. The balance sheet shows total assets of £523,744, of which £332,130 is represented by patents and £42,255 by preliminary expenses.

British Alkaloids.—For the period ended March 31 last, the report states that the lease of 86, Banner Street has been disposed of during period under review, and plant therefrom has been transferred to freehold factory at Willesden. The sum of £911 has been expended on additions to plant and machinery. During the thirteen months covered by the accounts there has been an increase of 44 per cent. in gross sales as compared with the preceding period of similar duration. Sales for the first month (April) of current financial year show an increase of over 30 per cent. on sales for the corresponding month of 1930. In view of continually increasing sales necessitating carrying of larger stocks, further capital is needed, and it has, therefore, been decided to make a call of 2s. 6d. per share on the partly-paid preference shares. The gross profit for the period under review amounts to £19,749, and, after deduction of distribution and overhead expenses, there remains a profit of £2,494, to which must be added a balance brought forward £327, making £2,821. The directors have written off preliminary expenses £156, and brokerage £107, and have transferred to taxation reserve £100, and recommend dividend of 8 per cent. on the amount paid up on participating preference shares, leaving to be carried forward £349.

New Chemical Trade Marks

Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to June 20, 1931.

SPEEGLOSS.

522,117. Class 1. Paints, varnishes, enamels (in the nature of paint), colours, distempers, japans, lacquers, paint and varnish driers, wood preservatives, wood stains, anti-corrosive and anti-fouling compositions and anti-corrosive oils. Nobel Chemical Finishes, Ltd., Imperial Chemical House, Millbank, London, S.W.1; manufacturers. April 21, 1931.

SCHWESOL.

522,183. Class 1. Colloidal sulphur, being a chemical substance for use in manufactures. Einstein's Electro Chemical Process, Ltd., 3, Central Buildings, Westminster, London, S.W.1; manufacturers. April 22, 1931.

SANKOR.

521,271. Class 4. Raw, or partly prepared, vegetable, animal, and mineral substances used in manufactures, not included in other classes. British Dyestuffs Corporation, Ltd., Hexagon House, Blackley, Manchester; manufacturers. March 18, 1931. (By consent.)

Chemical Trade Inquiries

These inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CZECHOSLOVAKIA.—An agent in Prague desires to secure the representation of Scottish manufacturers of cod meal and white fish meal.

UNITED KINGDOM.—The Dewsbury and Heckmondwike Waterworks Board are inviting tenders for the supply of powdered chalk for 12 months (about 150 tons). Tender forms may be obtained on application to the Engineer to the Board, Waterworks Offices, Church Street, Dewsbury.

BRITISH INDIA.—The Director-General, India Store Department, Belvedere Road, Lambeth, London, S.E.1, invites tenders for acidum citricum B.P. and potassii citras B.P. Forms of tender are available from the above at a fee (which will not be returned) of 5s. Tenders are due June 12.

Tariff Changes

PALESTINE.—An order, dated March 19, prohibits the import into or export from Palestine (except under licence from the Commandant of Police) of all manufactured explosives and the following organic nitro compounds, viz.:—nitro-naphthalenes, benzenes, toluenes, glycerines, glucoses, celluloses and phenols.

German Rayon Profits

THE Vereinigte Glanstoff-Fabriken A.-G. reports a gross profit of £345,000 for the past year. As £480,000 is applied to depreciation, there remains a loss of £135,000 to carry forward. The Aku Algemeine Kunstzijde Unie N.V. reports a gross profit of £240,000, which, added to the amount brought forward, makes £817,000 available. Some £358,000 has been applied to depreciation, and, after paying the priority and preference dividends, £383,000 is carried forward.

Proprietary Smokeless Fuel

AT the appeal of Low Temperature Carbonisation, Ltd., against a decision of the Assistant Comptroller of Patents, in respect of a trade mark for smokeless fuel, which was referred to in THE CHEMICAL AGE, May 23, page 376, Mr. Robert Burrell was junior counsel appearing for the appellants, and not Mr. Bevan as stated in our report.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

TALLOW OIL PRODUCTS, LTD., London, W. (M., 6/6/31.) Registered May 18, £7,500 debenture, to J. Lenz, 54, Kings Road, Brighton; general charge.

TECHNO-CHEMICAL LABORATORIES, LTD., London, S.W. (M., 6/6/31.) Registered May 21, £1,200 Land Registry charge, to S. Enever, 10, Sergeants Inn, E.C., and another; charged on Fairlawn, Clarence Road, Wandsworth. *£50,000. January 14, 1931.

PARENT COAL CARBONISATION TRUST, LTD., London, E.C. (M., 6/6/31.) Registered May 19, series of £60,000 debentures present issue £1,000; general charge. *Nil. September 2, 1930.

DICKINSON (ARTHUR J.), LTD., London, S.E., tar distillers, etc. (M., 6/6/31.) Registered May 18, £800 debenture, to J. A. Keen, Manor Farm, Thames Ditton, and another; general charge. *——. December 31, 1930.

Satisfaction

CONSOL PRODUCTS, LTD., Sunbury Common, manufacturers of essences, etc. (M.S., 6/6/31.) Satisfaction registered May 20, all moneys, etc., registered December 6, 1927.

London Gazette, &c.

Bankruptcy Information

WILKINSON, George Harold, The Hollies, Haygate Road, Wellington, Salop, chemical manufacturer, and carrying on business at The Wrekin Chemical Works, Stirchley, Salop, under the style or firm of "THE WREKIN CHEMICAL CO." (R.O., 6/6/31.) Receiving order, May 29, debtor's petition. First meeting, June 10, 11.30 a.m., 22, Swan Hill, Shrewsbury. Public examination, July 1, 1931, 11 a.m., Shire Hall, Shrewsbury.

New Company Registered

ROBERT A. MUNRO AND CO. (U.K.), LTD., 116, Hope Street, Glasgow. Registered in Edinburgh, May 27. Nominal capital £10,000 in £1 shares. Manufacturers of, agents for and dealers in fertilisers, chemicals, minerals, seeds for agricultural and horticultural purposes, etc. A subscriber: W. C. Smith, 14, Monreith Road, Newlands, Glasgow.

Voluntary Liquidation of Nitrate Companies

AT an extraordinary general meeting of the Lagunas Nitrate Co., Ltd., in London, on Wednesday last, June 3, a resolution was passed that the company should go into voluntary liquidation. Mr. Francis Watson, the chairman, briefly explained that agreement had been reached with one of the principal companies in Chile for the sale of the undertaking on certain conditions which should prove eminently satisfactory to the shareholders in the Lagunas Nitrate Co.

Meetings were also held of three other companies forming the Sabion-Cello group—the Alianza Co., the Pan de Azucar Co. and the Liverpool Nitrate Co.—when similar resolutions were formally passed.

Market for Dyes in Hungary

A CONFIDENTIAL report on the market for dyes in Hungary has been prepared by the Department of Overseas Trade from information furnished by the Commercial Secretary to H.M. Legation at Budapest and is being issued to firms whose names are entered on its Special Register. British firms desirous of receiving a copy of this report, together with particulars of the Special Register service, should communicate with the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1, quoting Ref. F.X. 1147.